DOCUMENT A00840

MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER QUALITY CERTIFICATION APPLICATION

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March 16, 2023

Heidi Davis
Massachusetts Department of Environmental Protection
Wetlands Program
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Water Quality Certification: Bridge Replacement (W-38-003) Butters Row over MBTA
Wilmington, MA
MassDOT Project 608929
BRP WW 11 Fill Project Certification

Dear Ms. Davis,

The Massachusetts Department of Transportation – Highway Division (MassDOT) is submitting this Water Quality Certification application for Fill (BRP WW 11) for the proposed replacement of the Butters Row Bridges (No. W-38-003) over the MBTA in Wilmington, MA. This project is being filed under the MassDOT bridge exemption because the replacement is the functional equivalent and in similar alignment to the existing bridge. A Self Verification (SV) Permit application will be filed with the U.S. Army Corp of Engineers. A pre-application meeting was held with MassDEP on November 29, 2022.

This project will involve the replacement of the existing structure along with realignment of the intersection with Rt. 38. The proposed project will permanently impact of 251 square feet of Bordering Vegetated Wetlands (BVW) for the placement of fill. The proposed project will temporarily impact 208 square feet BVW for the installation of erosion control measures. A wetland replication area of approximately 300 square feet is proposed alongside the same wetland. Wetland resource areas were delineated by a professional wetland scientist in June 7, 2020.

The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief. The project proponent hereby requests that the certifying authority review and take action on this CWA 401 certification request within the applicable reasonable period of time.

If you require any additional information regarding the subject project, please contact me at (978) 429-1772 or by email at melissa.lenker@dot.state.ma.us.

Sincerely,

Melissa Lenker

Melissa Lenker
Wetlands & Water Resources Supervisor
MassDOT Highway Division, Environmental Services

Cc: Dan Vasconcelos, ACOE
Eamon Kernan, MassDOT
Ryan Morrison, MassDEP
Ryan Hale, MassDEP
Wilmington Conservation Commission

WATER QUALITY CERTIFICATE APPLICATION

Replacement of Bridge No. W-38-003 (2NV)
Butters Row over MBTA
Wilmington, Massachusetts

MassDOT Contract No. 608929

Prepared for

Massachusetts Department of Transportation

March 14, 2023

Prepared by

GREEN INTERNATIONAL AFFILIATES, INC.
Civil and Structural Engineers

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WATER QUALITY CERTIFICATE FORMS

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

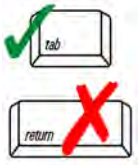
BRP WW 10 Major Project Certification
BRP WW 11 Minor Project Certification

401 water Quality Certification for Fill and excavation Projects in waters and Wetlands

Transmittal Number #

A. Applicant Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Which permit category are you applying for?

☐ BRP WW 10 ☒ BRP WW 11

2. Applicant/Owner:

Massachusetts Department of Transportation - Highway Division
Name

10 Park Plaza, Room 7360
Address

Boston	MA	02116
City/Town	State	Zip Code

Melissa Lenker
Contact Person

Melissa.Lenker@dot.state.ma.us	(978) 429-1772
Telephone (home)	(work)

3. Authorized Agent

Green International Affiliates, Inc.
Name

100 Ames Pond Drive, Suite 200
Address

Tewksbury	MA	01876
City/Town	State	Zip Code

Danielle Spicer
Contact Person

dspicer@greenintl.com	978-923-0400
Telephone (home)	(work)

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 10 Major Project Certification
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B. Project Information

1. Project Location:

Butters Row over MBTA/Pan Am railroad tracks, Bridge No. W-38-003
Address

Wilmington	MA	01887
City/Town	State	Zip Code

Maple Meadow Brook (over 1,000 feet west)
Nearest or Adjacent Waterbody

2. Project Name (if any):

Bridge Replacement, Bridge No. W-38-003 (2NV), Butters Row over MBTA

3. a. Describe project purpose:

The purpose of this project is to replace the existing Bridge No. W-38-003 (2NV) because the existing bridge is structurally deficient and functionally obsolete. The existing superstructure has a low clearance of 16'-3" over MBTA/Pan Am Railroad, with a history of the bridge being hit multiple times by trains or rail maintenance vehicles.

b. Is the project

☐ water-dependent ☒ non water-dependent

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

BRP WW 10 Major Project Certification
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B. Project Information (cont.)

4. a. provide a brief description of the proposed project (See Application Instructions and include a copy of the Notice of intent, if any.):

The proposed work consists of the replacement of the Bridge No. W-38-003, carrying Butters Row over MBTA/Pan Am railroad tracks the Town of Wilmington. The project also includes realignment and reconstruction of an approximately 700-foot section of the Butters Row that contains the bridge and its eastern/western approaches. Butters Row will be closed during demolition of the existing bridge and construction of the proposed bridge. The detour around the work site will utilize Chestnut Street, Burlington Avenue, and Main Street (Route 38). (see Project Narrative for more details)

b. Notice of Intent File number (if any): N/A

5. Identify the loss in square feet of each type of resource area (see Application Instructions for additional information.):

a. Bordering vegetated wetland: 251 (perm.); 208 (temp.) square feet

b. Isolated vegetated wetland: 0 square feet

c. Land under water: 0 square feet

d. Total cumulative loss of a. + b. + c.: 251 (perm.); 208 (temp.) square feet

e. Salt marsh: 0 square feet

6. a. Will the proposed project occur in any wetlands or waters designated as "Outstanding Resource Waters"?

☐ Yes ☒ No

If yes has public notice been published in the Environmental Monitor?

☒ Yes ☐ No TBD Date of Publication

b. Is this project a subdivision or any part of a subdivision? ☐ Yes ☒ No

c. Is the project categorically subject to MEPA? ☐ Yes ☒ No

If yes, has final action been taken? ☐ Yes ☐ No

If yes, please include copy of MEPA certificate.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands and Waterways

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B. Project information (cont.)

7. Alternatives Analysis:

   As related to the project purpose, attach a detailed description of alternatives to the proposed project that were considered and why none are available that avoid adverse impacts to wetlands and waters.

   If no alternatives are available, describe how the activity will minimize or mitigate the adverse impacts to wetlands and waters.

   See application instructions for information required. Attach required documentation.

C. Additional Information

1. Is any of your proposed work exempt from the Massachusetts Wetlands Protection Act or taking place in a federal non-state wetland?

   ☒ Yes ☐ No

   If yes, see Application Instructions for additional information needed.

2. Public notice to a newspaper of general circulation within the area of the proposed activity must be published within 10 days of the date of this application. Is proof of public notice submitted?

   ☒ Yes ☐ No

   (See Application Instructions for additional information)

D. Certification

Application is hereby made for water quality certification.

"I certify that I am familiar with the work proposed and that to the best of my knowledge and belief the information contained in this application is true, complete, and accurate"

Applicant's Signature

Melissa Lenker
Print name

Agent's Signature

Danielle Spicer
Print Name

Date

1.0 INTRODUCTION AND OVERVIEW

The Massachusetts Department of Transportation, Highway Division (MassDOT) proposes to replace the Bridge No. W-38-003 (2NV) which carries Butters Row over the MBTA Commuter Lowell line/Pan Am Railroad in the Town of Wilmington. The bridge is located on Butter Row in the central part of the Town of Wilmington approximately 300 feet southwest of the Butters Row/Main Street (Route 38) intersection as shown on Figure 1 in Attachment A.

The project will consist of the replacement of the Butters Row Bridge No. W-38-003 as well as full depth reconstruction of approximately 700-foot section of the Butters Row that contains the bridge and its eastern/western approaches between the Butters Row/Main Street (Route 38) and Butters Row/Factory Road intersections. The project also includes realignment and improvements to the adjacent Butters Row/Route 38/Cross Street intersection.

Related work within the project area will include realignment of Butters Row near its intersection with Route 38, full-depth roadway reconstruction, pavement milling and overlay, addition of new sidewalks and bicycle accommodating shoulders, horizontal and vertical alignment improvements, installing drainage and stormwater mitigation measures, construction of the retaining wall, new guardrails, signage, roadway pavement and subbase improvements, placing loam and seed and completing other landscape improvements as well as other incidental work as required.

This project consists of maintenance and improvement of an existing roadway and a bridge (including improvements to existing drainage systems and repaving). As the proposed project is a roadway project, it is therefore categorized as a "Redevelopment Project" under the Massachusetts Stormwater Management Standards. The project is therefore designed to meet the Standards to the maximum extent practicable. A stormwater report is attached demonstrating the compliance of the project with the ten state stormwater standards.

Since the proposed bridge is a Footprint Bridge, the project qualifies for the Bridge Exemption under Chapter 79, Section 24 of the Acts of 2014, also known as the 2014 Transportation Bond Bill and, therefore, will be exempt from state permitting (WPA, MEPA, Ch. 91, and CZM).

The proposed work within Waters of the United States requires a Section 401 Water Quality Certification pursuant to 314 CMR 9.04(4) since the project will involve activities not subject to M.G.L. c. 131, § 40 and the rpoject is subject to 33 U.S.C. 1251 and will result in minor discharge of fill material to bordering vegetated wetlands. Therefore, this minor fill Water Quality Certification application package is being submitted to the Department of Environmental Protection (DEP) in association with this project. The proposed work will not involve any dredging in waterways. This Application will also be filed with the Army Corps of Engineers (ACOE) pursuant to Section 404 of the Clean Water Act (CWA). The project is expected to qualify for a Self-Verification 404 permit.

2.0 PROJECT NEED

The purpose of this project is to replace the existing Bridge No. W-38-003 (2NV) because the existing bridge is structurally deficient and functionally obsolete. The existing superstructure has a low clearance of 16'-3" over MBTA/Pan Am Railroad, with a history of the bridge being hit multiple times by trains or rail maintenance vehicles.

3.0 EXISTING CONDITIONS

The existing bridge is located on Butters Row approximately 300 feet southwest of the Butters Row/Main Street (Route 38) intersection in the Town of Wilmington. The area surrounding Bridge No. W-38-003 (2NV) is relatively flat and rural, with forested land, forested and non-forested wetlands with some low-density residential properties around the project limits. Butters Row is a two-lane, two-way road classified by MassDOT as an Urban Collector and is owned and maintained by the Town of Wilmington, with the exception of approximately 67 feet of the roadway including the Bridge No. W-38-003 (2NV), which is under MassDOT jurisdiction. The roadway in the vicinity of the project area provides generally east-west movements connecting to Route 38 (Main Street) northeast of the project limits and Chestnut Street southwest of the project limits in the Town of Wilmington. The road has an average traffic flow of approximately 2,809 vehicles per day, with 1.4% being truck traffic. The posted speed limit is 25 mph in both directions. In the area of the single-lane portions of the eastern and western approaches, the posted speed limit is 15 mph. At present, there are no dedicated bicycle accommodations on the roadway or the bridge.

The existing Bridge No. W-38-003 (2NV) is a three-span simply supported structure with an overall length of 66'-5" and an overall width of approximately 15'-5". The spans vary in lengths and are 20'-10", 26'-4" and 19'-3" long respectively. The structure has a curb-to-curb width of 13'-6" feet with chain link fence mounted to the back of timber safety curbs along both sides of the roadway. The bridge carries one (1) 13'- 6" wide travel lane, serving both directions, with no shoulders or sidewalk on either side. Convex mirrors are present on each side of the bridge to aid motorists see oncoming traffic on the other side of the bridge. There are no roadway markings on the bridge. The existing horizontal clearance from centerline of railroad track to face of structure does not meet standards (7'-0" west/ 6'-10" east). The bridge substructure is in fair condition overall, with the bridge seats and backwalls in satisfactory condition, and the breastwalls and wingwalls in fair condition due to extensive cracking, spalling, and scaling. There are several overhead utilities running along Butters Row. Overhead wires on the bridge run on the west side of the road.

Under existing conditions, surface runoff on Butters Row is distributed by "country drainage" off the pavement edges. The existing site can be analyzed as 5 watershed areas contributing runoff to 5 discharge points. There is an existing 30-inch diameter concrete pipe on the western side of the bridge that connects a vegetated wetland on the west side with an intermittent stream on the east side of Butters Row. There are no separate closed drainage systems within the project limits.

Protected wetland resource areas are located on both sides of Butters Road adjacent to the project limits. All vegetated wetlands and streams on site belong to the Ipswich River headwaters watershed within the major Charles River Basin. A delineation of the wetland boundaries within and adjacent to the project limits was completed by Lucas Environmental, LLC on May 21 and 22, 2020, in accordance with the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40) and regulations (310 CMR 10.00 *et seq.*); Section 404 of the Clean Water Act (33 U.S.C. 1344); Massachusetts Department of Environmental Protection (MassDEP) publication "Delineating Bordering Vegetated Wetlands" under the Massachusetts Wetlands Protection Act (1995); and the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual (1987); the Northcentral and Northeast Regional Supplement (2012); and the Town of Wilmington Wetlands Enforcement Bylaw (the "Bylaw").

4.0 PROPOSED CONDITIONS

The proposed bridge will be constructed in the same location; however, the proposed horizontal alignment will be offset to the west from the existing roadway centerline in the bridge area and will

approximately follow the same bearing. As a result of the proposed bridge replacement, a minimum vertical clearance of 18'-6" will be achieved to avoid future train impacts to the bridge superstructure.

The proposed bridge will be a simply supported single span structure with a span length of 40'-3", a curb-to-curb width of 32'-0" feet and an out-to-out width of 45'-6" feet. The proposed superstructure will consist of 7 steel rolled beams with an 8" full depth cast-in-place composite concrete deck and a 3" superpave wearing surface. Beams will be spaced 6'-9" on center with 2'-6" overhangs. The existing piers and abutments will be removed, and the proposed abutments will be installed within the existing first and third spans to provide the required horizontal clearances from the railroad. The proposed abutments will be reinforced concrete cantilever type abutments and will require filling in the remainder of the existing first and third spans for the approach roadway. Proposed wingwalls/retaining walls will be u-type walls to tie into the approach roadway grading and contain the proposed fill. The new cantilever abutments will be supported on reinforced concrete pile caps and drilled micropiles with sockets into bedrock.

The proposed bridge will carry two 11-foot wide travel lanes, one in each direction, two 5-foot shoulders and two 5'-6" sidewalks on both sides. There will also be a cantilever retaining wall supported on micropiles constructed along the NW approach to maintain the access road below. Work will also include installation of granite curb and concrete sidewalks and guardrail.

Butters Row will have a curb-to-curb width of 32'–0" with a total roadway width of 43'-0". It will carry two 11-foot travel lanes, one in each direction, 5-foot shoulders, and 5'-6" wide sidewalks (including curb). Since Butters Row is an Urban Collector with a relatively low design speed of 25 mph (15 mph on the bridge), no special provisions will be made for pedestrian traffic. Pedestrians and bicycles will be accommodated on the roadway as per existing conditions.

Butters Row will be closed during demolition of the existing bridge and construction of the proposed bridge. The detour around the work site will utilize Chestnut Street, Burlington Avenue, and Main Street (Route 38).

The project also provides a modified drainage collection system to address the changes caused by the proposed road improvements as well as protecting the nearby downstream watershed and the environment. The proposed drainage improvements include installation of new deep sump catch basins, new drain manholes and new drainage outfalls, as well as proposed infiltration Best Management Practice (BMP) to mitigate the increase in peak rates of runoff.

The anticipated duration of construction is a period of 24 -30 months.

5.0 ANTICIPATED CONSTRUCTION SEQUENCE

The Butters Row Bridge No. W-38-003 (2NV) will be fully closed for approximately one (1) year and there will be no access from Butters Row to Route 38 during construction. The detour route will utilize Chestnut Street, Burlington Avenue (Route 62) and Main Street (Route 38). Construction phasing will ultimately be determined by the project contractor and is assumed to generally be as follows:

Construction Sequence

1. Install erosion and sedimentation control measures.
2. Install detour signage and close portion of Butters Row within project limits to traffic.
3. Fence off, mobilize equipment and crews, prepare work area(s) and set up staging and storage area(s).
4. Construct Wetland Replication Area.
5. Construct BMP1.

6. Install shielding and remove existing bridge superstructure.
7. Install SOE as needed and remove existing bridge substructure.
8. Install proposed bridge substructure and retaining walls.
9. Install bridge superstructure deck, and water line.
10. Install bridge railing and handrail on approaches.
11. Install new pavement on Butters Row
12. Stripe new pavements.
13. Install landscaping and grassed areas
14. Remove sediment and erosion control measures and dispose of same.
15. Remove detour signage.

Equipment that is likely to be utilized for this project includes dump trucks, flatbed trucks, front-end loader(s), backhoe(s), skid steer(s), excavator, hoe rams, drilling rigs, piling rigs, concrete pumpers, air hammers, air compressor(s), and cranes. Equipment can be parked on roadway pavements off-limits for construction staging purposes. Staging equipment in Vegetated Wetland and/or Waterway resource areas overnight or on weekends shall be prohibited.

6.0 IMPACTS TO WATERS OF THE UNITED STATES

The project's resource area impacts will occur in Vegetated Wetlands (VWs), resulting from permanent construction and temporary work taking place along Butters Row. Vegetated Wetlands are present in the vicinity of the bridge. There are no Isolated Vegetated Wetland present in the vicinity of the project. The proposed work will not affect an intermittent stream present in the vicinity of the project. No work on stream crossings is required to construct the bridge and proposed Butters Row improvements.

The overall impacts to Vegetated Wetlands are summarized below:

Table 5.1: Vegetated Wetland Impacts

Resource Area/Location	Permanent Impacts (ft^2)	Temporary Impacts (ft^2)
VW B-C/northeastern quadrant	137	132
VW C / southeastern quadrant	114	76
TOTAL	**251**	**208**

To minimize the impacts to Vegetated Wetlands, proper erosion and sediment controls will be installed during construction. This includes the installation of compost filter tubes around the work areas. Means and methods of sediment & erosion controls will ultimately be determined by the project contractor.

6.1 Permanent Vegetated Wetland Impacts

Permanent filling of a 137 square feet of VW C-B-series located on the west side of Butters Row cannot be avoided due to the proposed Butters Row realignment west of the existing roadway near the intersection with Route 38. The new retaining wall is proposed at this location in order to minimize wetland disturbance to the maximum extent feasible. Permanent filling of a 114 square feet of VW C-series located on the west side of Butters Row south of the bridge cannot be avoided due to the proposed new outfall associated with the proposed closed drainage system on Butters Row. No permanent impacts to the intermittent stream at Sta. 53+00 are anticipated.

6.2 Temporary Vegetated Wetland Impacts

Temporary disturbance to VW C-B- and C-series will be required for installation of Erosion & Sediment Controls. After the erosion controls have been removed the BVWs will be restored to preexisting conditions in accordance with the MassDOT Specification.

7.0 WETLAND REPLICATION/MITIGATION

The project has been designed to avoid wetland resource area impacts to the maximum extent practicable and will mitigate unavoidable resource area impacts in accordance with state regulations (Massachusetts Wetland Protection Act regulations at 310 CMR 10.55(4)(b), and the Massachusetts Department of Environmental Protection's ("MassDEP") "Massachusetts Inland Wetland Replication Guidelines" (MassDEP, March 2002)). Vegetated Wetland areas impacted by the construction activities will be replicated in accordance with the standards cited above. Project elements are incorporated into the proposed work that help to minimize impacts to wetland resource areas.

To mitigate for total Vegetated Wetland (VW) losses (fill) of 251 square feet associated with the subject project, a wetland replication area is proposed adjacent to the wetland series C-B as shown on the plans. The wetland replication area will contain an area of approximately 300 square feet and will provide mitigation for the wetland losses at an approximate ratio of slightly greater than 1:1 and in accordance with the MassDOT Specification 755.35, INLAND WETLAND MITIGATION AREA. Adjacent disturbed upland areas will be loamed and seeded upon completion of construction.

8.0 SEDIMENTATION CONTROL MEASURES

To protect the wetland resource areas during construction, a combination of erosion and sediment control BMPs will be installed. Erosion control measures will be implemented as described on the approved plans. The Contractor will have a stockpile of materials required to control erosion on-site to be used to supplement or repair erosion control devices. These materials will include, but are not limited to, compost filter tubes, coir fiber rolls, sedimentation fence, silt sacks for catch basins, erosion control matting and crushed stone. The erosion controls will be maintained in good condition until on-site soils are stabilized. All areas will be permanently stabilized following the completion of construction work.

9.0 DEWATERING

It is anticipated that a NPDES Construction General Permit (CGP) will be required for the project; therefore, if dewatering is needed, all pumped effluent will be done in compliance with the dewatering requirements within the CGP. There will be no direct discharge of pumped water into any wetland, resource area, or closed drainage system.

10.0 STORMWATER MANAGEMENT

Stormwater management for this project has been designed in compliance with the Stormwater Management Standards as defined in detail in the DEP's Stormwater Management Handbook. As the proposed project is categorized as a "Redevelopment Project" under the Massachusetts Stormwater Management Standards, therefore, the project is designed to meet the Standards to the maximum extent practicable.

Please refer to the Stormwater Report included as Attachment F to this Application for detailed Stormwater Management measures proposed for this project.

11.0 FISHERIES AND WILDLIFE / NATURAL HERITAGE ENDANGERED SPECIES / VERNAL POOLS

There are no Fisheries and/or Natural Heritage and Endangered Species Program (NHESP) Priority Habitat or Estimated Habitat for any species of concern in proximity to the project area. The nearest Priority Habitat of rare species based on the 15th Edition Natural Heritage Atlas, last released on August 1, 2021, is PH 1686, located approximately 1.6 west of the project limit. There are no Certified Vernal Pools (CVPs) identified on MassGIS closer than 2,200 feet northeast of the Butters Row/Route 38 intersection. There are no Potential Vernal Pools (PVPs) closer than 1,600 feet southwest of the Butters Row/Factory Road intersection. MassDOT does not anticipate any portion of this project to negatively impact these vernal pools. The project is not located within or in close proximity to Areas of Critical Environmental Concern (ACECs). The closest Area of Critical Environmental Concern (ACEC) to the project site is the Golden Hills ACEC in the Town of Wakefield, the limits of which are no closer than 6.3 miles southeast of the project area. The closest Outstanding Resource Waters (Mill Pond Reservoir Intake Point – public water supply watershed) is located approximately 1.5 miles south of the project limits. Please refer to Figure 3 – Protected Resource Area Map in Attachment A for details.

According to the Federally Listed Endangered and Threatened Species in Massachusetts, the Northern Long-eared Bat (*Myotis septentrionalis*) (NLEB) is a proposed Endangered Species located Statewide; however, this species is protected by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Review of their habitat on NHESP's website indicate that in warmer months they can be found in forested areas, specifically in clustered stands of large trees and in colder months they can be found in natural caves and abandoned mines. The closest recorded NLEB hibernaculum is located 4.4 miles east of the project site in the Town of Reading. Based on this information the proposed project is not located within habitat that would support the NLEB; therefore it can be assumed that this project will not result in any impacts to the NLEB.

12.0 STREAM CROSSING NARRATIVE

The project does not impact any stream crossings within the project limits, therefore, compliance with the Massachusetts River and Stream Crossing Standards (revised June 2012) is not required.

13.0 ALTERNATIVE ANALYSIS

The intent of this project is to replace the existing Bridge No. W-38-003 (2NV) because the existing structure is structurally deficient and functionally obsolete. The existing superstructure, built in 1920 and reconstructed in 1978, has a low clearance of 16'-3" over MBTA/Pan Am Railroad, with a history of the bridge being hit multiple times by trains or rail maintenance vehicles.

Three alternatives have been identified by the proponent: "No Build", Bridge Replacement using Single Span Steel Rolled Beams with a Composite Concrete Deck (Preferred), Bridge Replacement using Three Span Steel Rolled Beams with a Composite Concrete Deck (Alternative B) and Bridge Replacement using Adjacent Concrete Deck Beams with Composite Concrete Deck (Alternative C).

Alternative 1: No Build

The "No-Build" Alternative assumes that the proposed superstructure replacement project would not be constructed, and the existing bridge would remain in place being structurally deficient, eventually requiring closure. In addition, if not reconstructed, the bridge will continue being frequently hit by trains and rail maintenance vehicles due to its inadequate horizontal clearance. This will have negative impacts on the surrounding areas. The intent of this project is to replace the existing Bridge No. W-38-003 (2NV) because the existing structure is structurally deficient and functionally obsolete. The bridge was built in 1920 and was reconstructed in 1987 and is currently not allowing adequate clearance over the tracks. It has been recommended that the bridge be replaced with a new superstructure to allow adequate clearance over the tracks. Therefore, the "No-Build Alternative" does not meet the purpose and need of the project, and it was therefore dismissed from further consideration.

Alternative 2: Bridge Replacement using Single Span Steel Rolled Beams with a Composite Concrete Deck (Preferred)

The Bridge Replacement using Single Span Steel Rolled Beams with a Composite Concrete Deck (Preferred Alternative) was the most cost-effective structure with the shortest and simplest construction method which also minimized impacts to the approach roadways and communities on either side of the structure, while providing required horizontal and vertical clearances. In addition, the Preferred Alternative allows room for carrying future utilities and provides the easiest structure for performing repairs to extend the life of the structure.

Alternative 3: Bridge Replacement using Three Span Steel Rolled Beams with a Composite Concrete Deck (Alternative B) and Bridge Replacement using Adjacent Concrete Deck Beams with Composite Concrete Deck (Alternative C)

Similar to preferred alternative, the Alternative 3A uses steel rolled beams, which have a higher life cycle cost, since they are subject to more deterioration from corrosion and require more maintenance to preserve them. However, a three-span structure will have a higher cost and construction duration since there are four (4) substructure elements to construct.

The Alternative 3B using precast concrete deck beams was not selected due to these beams being significantly heavier than the steel girder alternatives, which would require larger equipment to ship and erect on site. In addition, concrete beams are more difficult to repair than steel beams if there are damages from train impact or corrosion. This alternative would also provide limited room to carry utilities, as they must be mounted to the exterior beams or have a special sidewalk beam to fit the utilities.

14.0 SPECIFICATIONS TO BE INCLUDED IN CONTRACT

- ☒ Demo
- ☒ Wetland Replication (ITEM 755.35 INLAND WETLAND REPLICATION AREA)
- ☒ Wetland Replication (ITEM 755.75 WETLAND SPECIALIST)
- ☒ Wetland Replication (ITEM 755.76 WETLAND MONITORING REPORTS)
- ☐ Mussel Survey/Transplant Protocol
- ☐ Vegetation Survey/Transplant Protocol

ATTACHMENTS

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Attachment A – Figures

- Figure 1 – USGS Map
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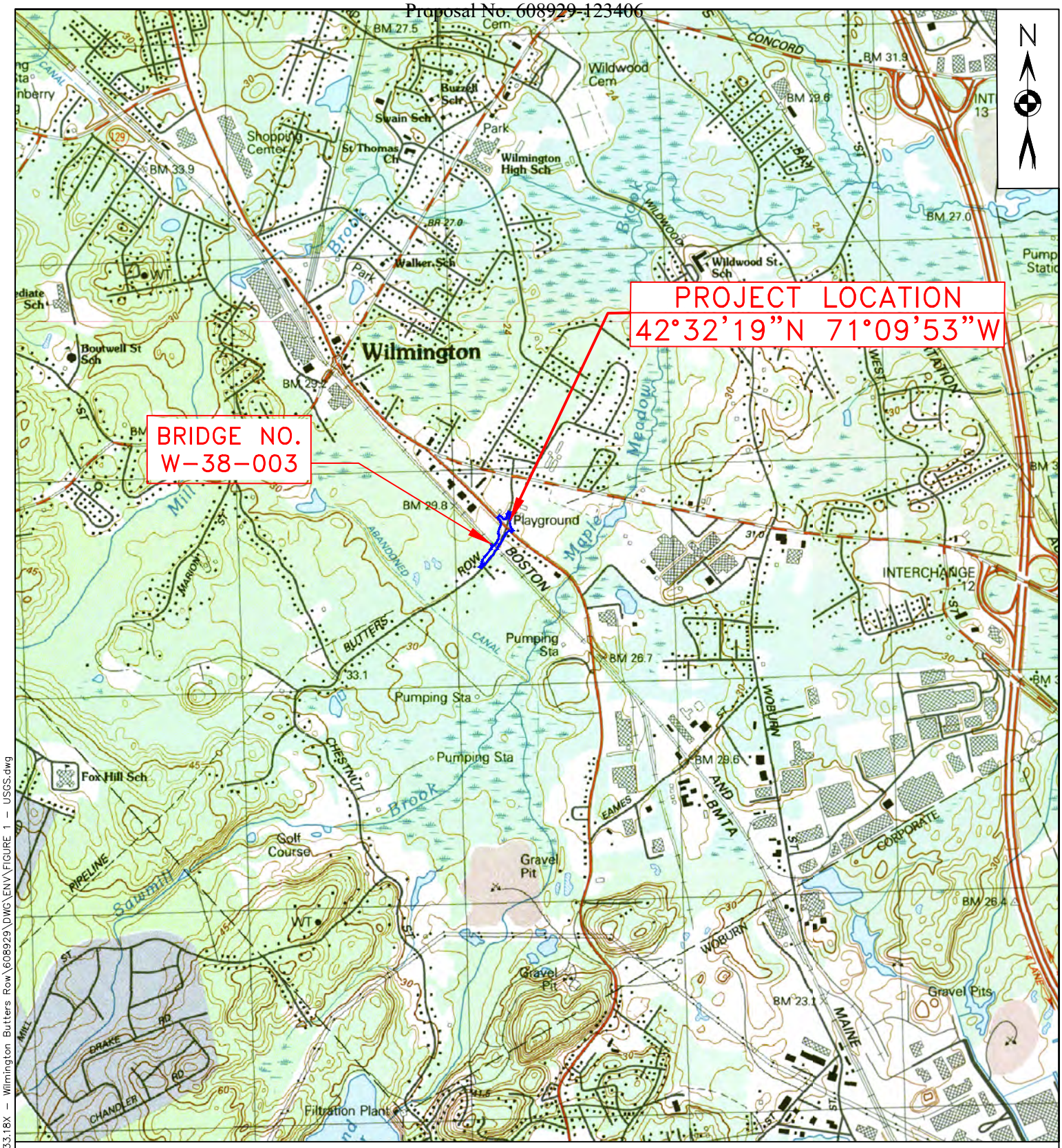
- Figure 4 – FEMA Map



LEGEND

APPROXIMATE LIMIT OF WORK

SCALE IN FEET

1000 0 1000 2000

ELEVATIONS IN METERS

USGS LOCUS MAP

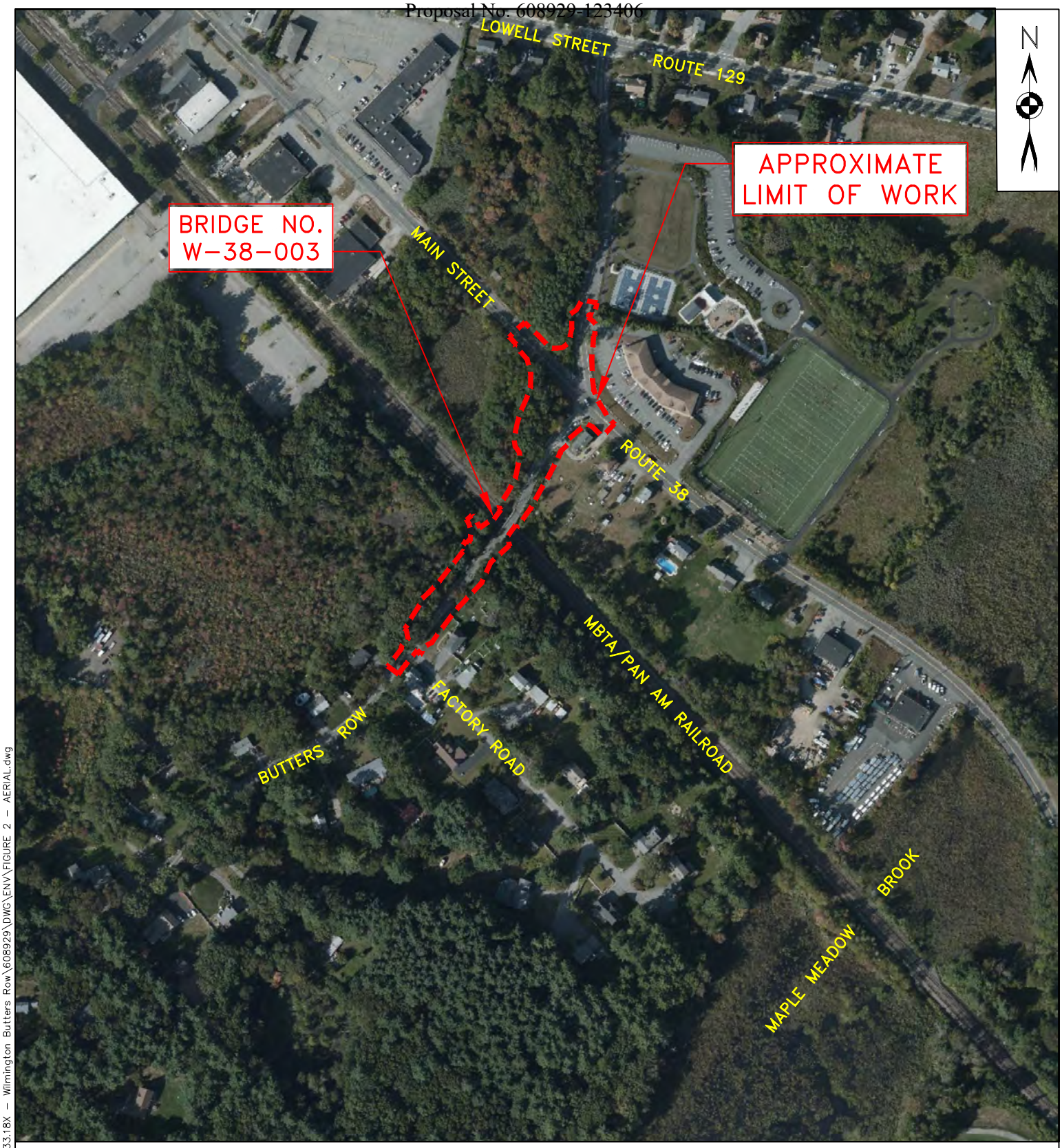
BRIDGE REPLACEMENT
BRIDGE NO. W-38-003 (2NV), BUTTERS ROW OVER MBTA
WILMINGTON, MA, PROJECT #608929

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.18X	FIGURE 1
DATE: 6/21/2022	DRAWN BY: OF	
REVISED:	CHECKED BY: MC/DS	

Y:\Shared\Engineering\Projects\2013\13033\13033.18X - Wilmington Butters Row\608929\DWG\ENV\FIGURE 1 - USGS.dwg



LEGEND

APPROXIMATE LIMIT OF WORK

SCALE IN FEET

150 0 150 300

1" = 300'

NOTE: DATA TAKEN FROM MASSGIS

AERIAL LOCUS MAP

BRIDGE REPLACEMENT
BRIDGE NO. W-38-003 (2NV), BUTTERS ROW OVER MBTA
WILMINGTON, MA, PROJECT #608929

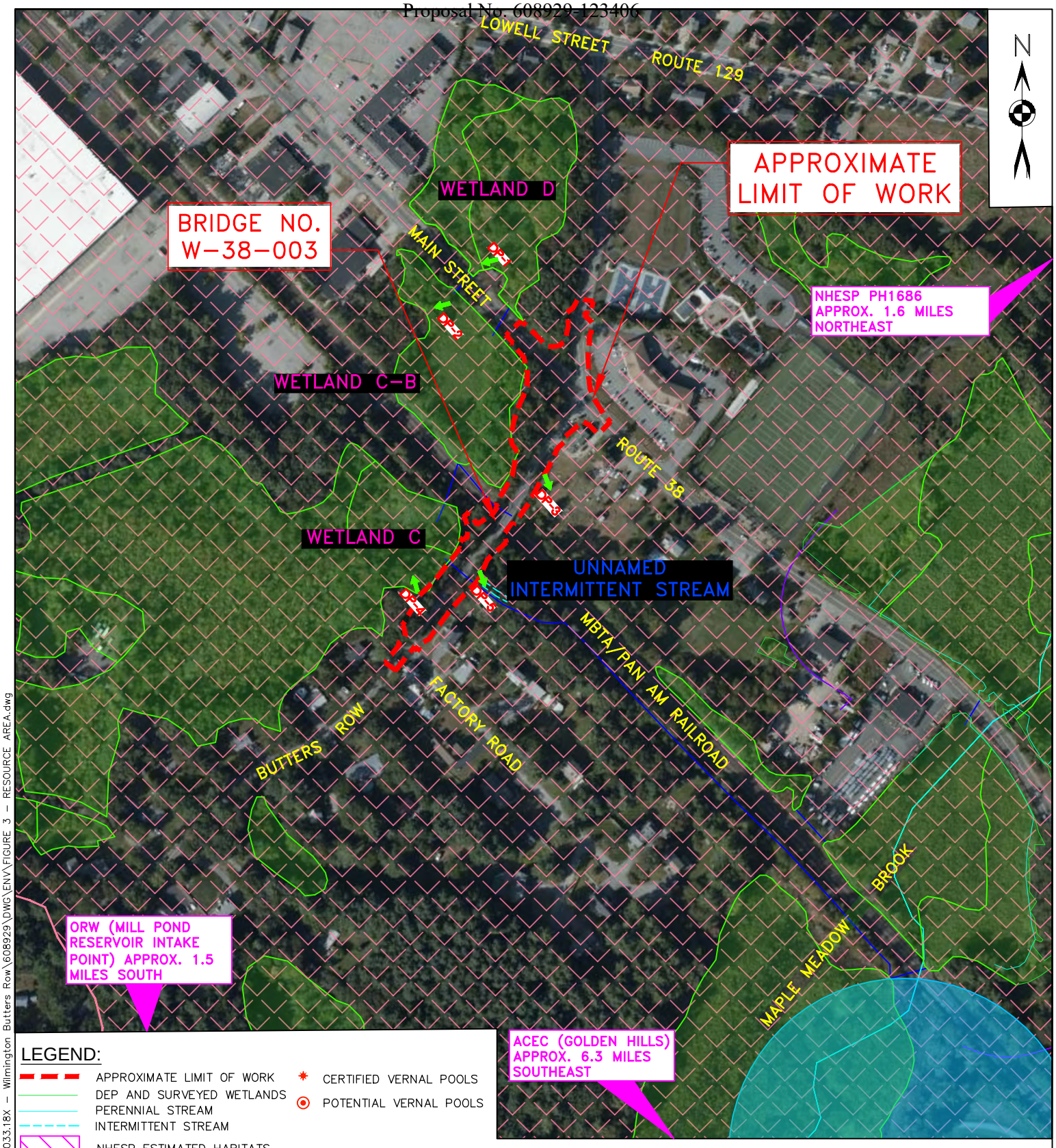
PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.18X
DATE: 6/21/2022	DRAWN BY: OF
REVISED:	CHECKED BY: MC/DS

FIGURE 2

Y:\Shared\Engineering\Projects\2013\13033\13033.18X - Wilmington Butters Row\608929\DWG\ENV\FIGURE 2 - AERIAL.dwg



LEGEND:

- APPROXIMATE LIMIT OF WORK
- DEP AND SURVEYED WETLANDS
- PERENNIAL STREAM
- INTERMITTENT STREAM
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- NHESP PRIORITY HABITATS OF RARE WILDLIFE
- OUTSTANDING RESOURCE WATER (ORW)
- AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)
- APPROVED WELLHEAD PROTECTION AREAS (ZONE II)
- DEP APPROVED WELLHEAD PROTECTION AREAS (ZONE I)
- CERTIFIED VERNAL POOLS
- POTENTIAL VERNAL POOLS

SCALE IN FEET
150 0 150 300
1" = 300'

NOTE: DATA TAKEN FROM MASSGIS

PROTECTED RESOURCE AREA MAP

BRIDGE REPLACEMENT
BRIDGE NO. W-38-003 (2NV), BUTTERS ROW OVER MBTA
WILMINGTON, MA, PROJECT #608929

PREPARED BY:
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239 LITTLETON RD, WESTFORD, MA (978) 923-0400
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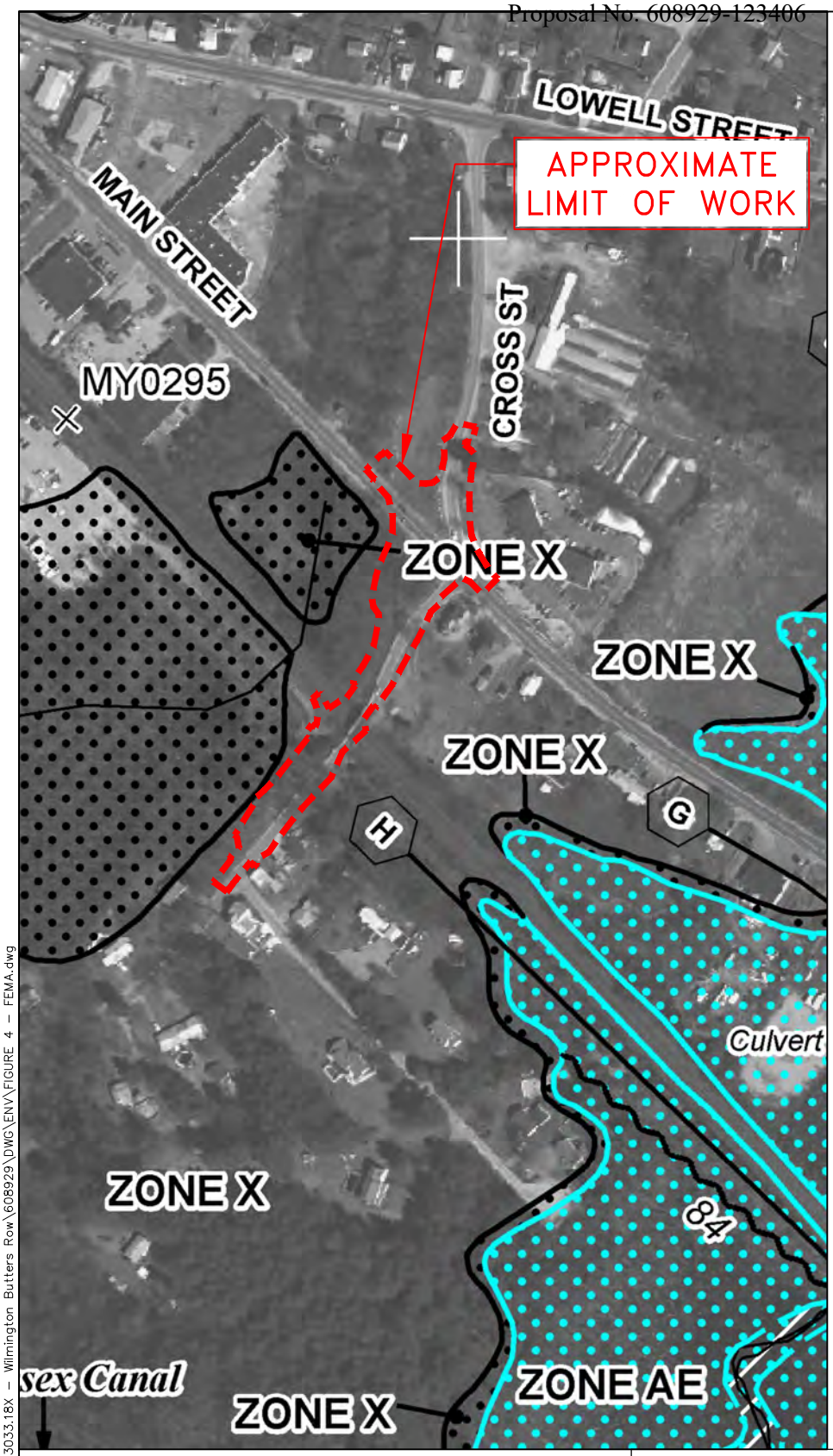
PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.18X
DATE: 6/21/2022	DRAWN BY: OF
REVISED:	CHECKED BY: DS

FIGURE 3

Y:\Shared\Engineering\Projects\2013\13033\13033.18X - Wilmington Butters Row\608929\DWG\ENV\FIGURE 3 - RESOURCE AREA.dwg



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000 FT N — 1000-meter Universal Transverse Mercator grid values, zone 19
- 600000 FT — 5000-foot grid values: Massachusetts State Plane coordinate system, Mainland zone (FIPSZONE 2001), Lambert Conformal Conic projection
- DX5510 x — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
June 4, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

LEGEND

APPROXIMATE LIMIT OF WORK

SCALE IN FEET
150 0 150 300
1" = 300'

NOTE:
THE FLOOD ZONE DATA SHOWN IS TAKEN FROM THE FEDERAL INSURANCE RATE MAPS (FIRM) FOR THE TOWN OF WILMINGTON, MA. (FIRM COMMUNITY PANEL 25017C0291E, DATED 06/04/2010.)

FEMA MAP

BRIDGE REPLACEMENT
BRIDGE NO. W-38-003 (2NV), BUTTERS ROW OVER MBTA
WILMINGTON, MA, PROJECT #608929

PREPARED BY:
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
239 LITTLETON RD, WESTFORD, MA (978) 923-0400
24 ALBION RD, LINCOLN, RI (401) 305-7895

PREPARED FOR:
massDOT
Massachusetts Department of Transportation
Highway Division

SCALE: AS NOTED	PROJECT NO. 13033.18X	FIGURE 4
DATE: 6/21/2022	DRAWN BY: OF	
REVISED:	CHECKED BY: MC	

Y:\Shared\Engineering\Projects\2013\13033\13033.18X - Wilmington Butters Row\608929\DWG\ENV\FIGURE 4 - FEMA.dwg

Attachment B – Site Photo Log

Photo Log – May 2019

Photo 1 – East of Sta. 57+20 - View looking southwest at the Bridge No. W-38-003 from Route 38/Butters Row intersection

Photo 2 – Approx. Sta. 51+00 – View looking northeast at the Bridge No. W-38-003 from the southern approach

Photo 3 – Approx. Sta. 54+20 – View of deck of the Bridge No. W-38-003 looking towards Route 38 (Main Street)

Photo 4 – Elevation view of east side of the Bridge No. W-38-003

Photo 5 – View of the northwest quadrant of Bridge No. W-38-003 over the MBTA/Pan Am Railroad

Photo 6 – View of the southwest quadrant of Bridge No. W-38-003 over the MBTA/Pan Am Railroad

Photo 7 – View looking northeast at the MBTA Commuter rail train under the Bridge No. W-38-003

Photo 8 – View looking northeast of the Bridge No. W-38-003 substructure

Photo 9 – Approx. Sta. 53+00 – View looking north at the inlet of the existing 30” concrete pipe (Wetland C)

Photo 10 – Approx. Sta. 53+00 – View looking northwest at the outlet of the existing 30” concrete pipe (Intermittent Stream IB)

Photo 11 – Approx. Sta. 51+70 – View looking north at Wetland C and MBTA access road from the western end of the Bridge

Photo 12 – View looking southwest towards the MBTA tracks from the northeastern quadrant of the Bridge

Attachment C – Public Notice

Public Notice

Massachusetts Department of Environmental Protection
MassDEP Wetlands Program
100 Cambridge Street
Suite 900, Boston MA 02114

Pursuant to 33 U.S.C. 1341 and M.G.L. c. 21 §§ 26 - 53, notice is given of a 401 Water Quality Certification application for minor fill associated with the proposed bridge replacement of Bridge No. W-38-003 (2NV) in the Town of Wilmington, MA, by the Massachusetts Department of Transportation – Highway Division, Ten Park Plaza, Room 7360, Boston, MA 02116. The project will include bridge replacement with realignment, and will include the reconstruction of an approximately 700-foot section of the Butters Row that contains the bridge and its eastern/western approaches between the Butters Row/Main Street (Route 38) and Butters Row/Factory Road intersections. Additional information may be obtained from the Massachusetts Department of Transportation Highway Division at the above address, Attention Melissa Lenker or melissa.lenker@state.ma.us. Written comments should be sent to MassDEP, Attention Heidi Davis, 100 Cambridge Street, Suite 900, Boston MA 02114 or heidi.davis@mass.gov within 21 days of this notice. Any group of ten persons, any aggrieved person, or any governmental body or private organization with a mandate to protect the environment who submits written comments may appeal the Department's Certification. Failure to submit written comments before the end of the public comment period may result in the waiver of any right to an adjudicatory hearing.

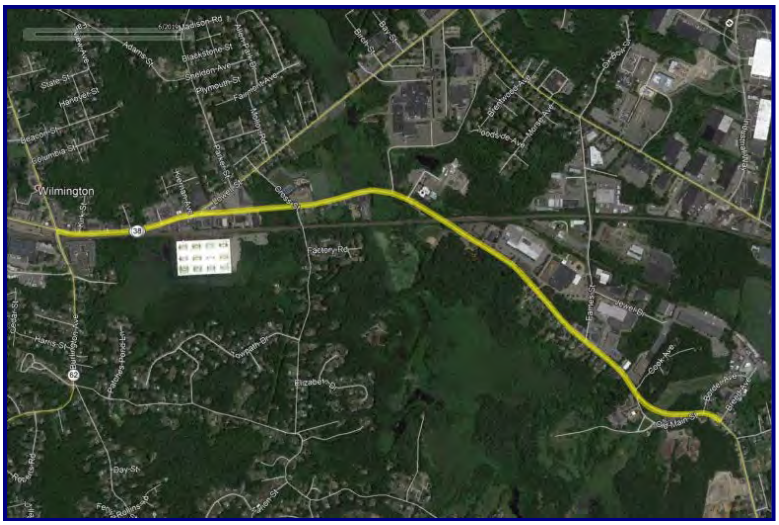
Attachment D – Wetland Resource Evaluation Memo with Wetland Data Forms

WETLAND SUMMARY REPORT

Route 38 Project
Route 62 to Woburn Town Line
Wilmington, Massachusetts

This Wetland Summary Report includes wetland areas subject to the Butters Row Bridge replacement project (MassDOT Project # 608929).

Only selected pages from the original report are included in this Attachment.



PREPARED FOR:
Green International Affiliates, Inc.
239 Littleton Road, Suite 3
Westford, Massachusetts 01886

PREPARED BY:
Lucas Environmental, LLC
500A Washington Street
Quincy, Massachusetts 02169

REPORT DATE: June 3, 2020

LUCAS ENVIRONMENTAL, LLC

June 3, 2020

Green International Affiliates, Inc.
Attn: Danielle Spicer, P.E.
239 Littleton Road, Suite 3
Westford, MA 01886

Re: Wetland Summary Report
Route 38 Project
Route 62 to Woburn Town Line
Wilmington, MA

Dear Ms. Spicer,

Professional Wetland Scientists (PWS) from Lucas Environmental, LLC (LE) conducted site investigations along Main Street (Route 38) in Wilmington, Massachusetts on May 21 and 22, 2020. The purpose of the site investigation was to investigate and delineate wetland resources along the portion of Route 38 located between Burlington Avenue/Church Street (Route 62) and the Wilmington/Woburn Town/City line. The site investigation was limited to wetland areas within 100 feet of and perennial streams within 200 feet of Route 38. This investigation included both a field and office-based component.

Please note that this due diligence effort is specific to environmental resources; it does not evaluate constraints related to local planning or zoning requirements.

MassDEP Bordering Vegetated Wetland Delineation Field Data Forms were completed as described herein and are included with this report.

If you have any questions, please do not hesitate to contact me at 617.405.4140 or cml@lucasenvironmetnal.net. Thank you for your consideration in this matter.

Sincerely,
LUCAS ENVIRONMENTAL, LLC

Christopher M. Lucas, PWS, CWS, RPSS
Environmental Consultant/Soil Scientist

Enclosures: Photographic Documentation
Wetland Delineation Field Data Forms

SECTION I – NARRATIVE

1.0 INTRODUCTION

Professional Wetland Scientists (PWS) from Lucas Environmental, LLC (LE) conducted site investigations along Main Street (Route 38) in Wilmington, Massachusetts on May 21 and 22, 2020. The wetland investigation was performed in accordance with the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40) and regulations (310 CMR 10.00 *et seq.*); Section 404 of the Clean Water Act (33 U.S.C. 1344); Massachusetts Department of Environmental Protection (MassDEP) publication "Delineating Bordering Vegetated Wetlands" under the Massachusetts Wetlands Protection Act (1995); and the U.S. Army Corp of Engineers (USACE) Wetland Delineation Manual (1987); the Northcentral and Northeast Regional Supplement (2012); and the Town of Wilmington Wetlands Enforcement Bylaw (the "Bylaw").

The following data sources were examined in addition to the site investigation:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map;
- United States Geological Survey Topographic Quadrangle (Wilmington, 2018);
- MassGIS MassDEP Wetland and Hydrography Datalayers;
- National Wetland Inventory (NWI) Maps;
- MassGIS Natural Heritage Atlas Datalayers; and
- United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Soil Survey.

2.0 EXISTING CONDITIONS

The area under investigation includes wetland areas within 100 feet and perennial streams within 200 feet of the portion of Route 38 between Burlington Avenue/Church Street (Route 62) and the Wilmington/Woburn Town/City line in Wilmington, Massachusetts (the Study Area). Within the Study Area, both sides of Route 38 are generally bounded by commercial and residential properties with the exception of the area in relatively close proximity to Maple Meadow Brook. Maple Meadow Brook is a perennial stream in the Ipswich River Basin that flows from southwest to northeast through the Study Area and is crossed by Route 38. An MBTA railroad track runs roughly parallel to and in close proximity to Route 38 within the northern portion of the Study Area.

A review of the current MassGIS data layer for the Massachusetts Natural Heritage Atlas (effective August 1, 2017) under the Natural Heritage and Endangered Species Program (NHESP) indicates that no portion of the site is located within Estimated Habitat of Rare Wildlife or Priority Habitat of Rare Species under the Massachusetts Endangered Species Act (321 CMR 10.00 et seq.). A Certified Vernal Pool under the jurisdiction of the Wetlands Protection Act Regulations (310 CMR 10.00 et seq.) is present near the Study Area, as are two mapped Potential Vernal Pools. The Mass CAPS Important Wildlife Habitat Map for Wilmington indicates a potential area of important habitat wildlife within approximately 150 feet west of Route 38, south of the Maple Meadow Brook crossing.

The Study Area is not located within an Area of Critical Environmental Concern (ACEC), Outstanding Resource Water (ORW), or Watershed Protection Area. Several MassDEP Zone I Wellhead Protection Areas are mapped near the Study Area, the closest being within approximately 90 feet of Route 38 near Maple Meadow Brook. In addition, most of the Study Area is located within a Zone II Wellhead Protection Area (Zone II #152, Wilmington Water Department).

Maple Meadow Brook (Segment ID MA92-04) is identified as a Category 5 water requiring a Total Maximum Daily Load (TMDL) per the Final MassDEP 2016 Integrated List of Waters (305(b)/303(d)). Waters are listed in Category 5 if they were identified as impaired (i.e., not supporting one or more intended uses), the impairment was related to the presence of one or more "pollutants", and the source of those pollutants was not considered to be natural. The causes of impairment in Maple Meadow Brook have been identified as dewatering* (*TMDL not required), and dissolved oxygen (no EPA TMDL Number).

3.0 ENVIRONMENTAL RESOURCE AREAS

Wetland resource areas identified within the Study Area include Inland Bank, Bordering Vegetated Wetland (BVW), Land Under Waterbodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), and Riverfront Area. Under the Massachusetts Wetlands Protection Act (WPA) and Wilmington Wetlands Enforcement Bylaw the wetlands in the Study Area are defined as follows. Note that the Bylaw does not define any resource areas differently than defined under the WPA.

3.1 Inland Bank – 310 CMR 10.54

Section 310 CMR 10.54 of the WPA defines a Bank *as the portion of the land surface which normally abuts and confines a water body. It occurs between a water body and a vegetated bordering wetland and adjacent flood plain, or, in the absence of these, it occurs between a water body and an upland. The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level.* The delineated Banks are described below.

3.2 Bordering Vegetated Wetlands – 310 CMR 10.55

Section 310 CMR 10.55 of the WPA defines BVW *as freshwater wetlands which border on creeks, rivers, streams, ponds and lakes. The types of freshwater wetlands are wet meadows, marshes, swamps and bogs. Bordering Vegetated Wetlands are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants. The boundary of Bordering Vegetated Wetlands is the line within which 50% or more of the vegetational community consists of wetland indicator plants and saturated or inundated conditions exist. Wetland indicator plants are also those classified in the indicator categories of Facultative, Facultative+, Facultative Wetland-, Facultative Wetland, Facultative Wetland+, or Obligate Wetland in the National List of Plant Species That Occur in Wetlands: Massachusetts (Fish & Wildlife Service, U.S. Department of the Interior, 1988) or plants exhibiting physiological or morphological adaptations to life in saturated or inundated conditions.* The delineated BVWs are described below.

3.3 Land Under Water Bodies and Waterways – 310 CMR 10.56

Section 310 CMR 10.56(2) of the WPA defines Land Under Water Bodies and Waterways *as the land beneath any creek, river, stream, pond or lake. Said land may be composed of organic muck or peat, fine sediments, rocks or bedrock. The boundary of Land under Water Bodies and Waterways is the mean annual low water level.* LUWW is present within Maple Meadow Brook within the Study Area. This resource area is located below the edge of Bank or the Mean Annual High Water (MAHW) mark of perennial streams, therefore it is not field delineated.

3.4 Bordering Land Subject to Flooding – 310 CMR 10.57

Section 310 CMR 10.57(2)(a) of the WPA defines BLSF as *an area with low, flat topography adjacent to and inundated by flood waters rising from creeks, rivers, streams, ponds or lakes. It extends from the banks of these waterways and water bodies; where a bordering vegetated wetland occurs, it extends from said wetland. The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm.*

Flood zones are present within the Study Area. According to the FEMA Flood Insurance Rate Maps (FIRM) for Middlesex County, Massachusetts, Maps Number 25017C0291E and 25017C0293E, effective June 4, 2010, areas designated as Zone AE are present within and along Maple Meadow Brook. Zone AE is classified as an area subject to the 1% annual chance flood (100-year flood), where base flood elevations have been determined. The flood elevations at Maple Meadow Brook are 82.9 feet (NAVD 88) upstream (west) of Main Street and 81.5 feet downstream (east) of Main Street, as provided by Green International Affiliates, Inc. based upon the flood profiles in the Flood Insurance Study. An AE Zone (elevation 95 feet), located within the flood plain of Mill Brook, is also mapped near the Study Area just north of Burlington Avenue.

Areas identified as Zone X are also present near the Study Area west of the MBTA tracks, between the MBTA tracks and Route 38 just north of Butters Row, and near Maple Meadow Brook. Zone X is defined as the 0.2% Annual Chance Flood Hazard (i.e., 500-year flood). The remainder of the Study Area is designated as a Zone X which is classified as an Area of Minimal Flood Hazard. The boundary of BLSF was not delineated in the field and should be identified on the plans.

3.5 Riverfront Area – 310 CMR 10.58

Section 310 CMR 10.58(2)(a)(3) of the WPA defines Riverfront Area *as the area of land between a river's mean annual high water line measured horizontally outward from the river and a parallel line located 200 feet away.* Maple Meadow Brook is mapped as perennial on the current USGS topographic map (Wilmington, Massachusetts Quadrangle, 2018) and is therefore presumed to be perennial. No other perennial streams are mapped within 200 feet of Route 38 within the Study Area. The MAHW line was delineated in the field as described for Stream 2 in the following section.

3.6 Wetland Descriptions

The following describes each of the wetlands identified in the Study Area. This description includes BVW only as no isolated wetlands were identified within the Study Area.

Wetland C & D

Wetland C is located on the south side of Route 38 in the general area northwest of the intersection of Route 38 with Butters Row. The BVW boundary was delineated with pink survey tape numbered sequentially with flag series WFC-1 to WFC-26. No stream channel was observed here, although there may be a blocked culvert. Wetlands D is located on the north side of Route 38 in the general area northwest of the intersection of Route 38 with Cross Street. The BVW boundary was delineated with pink survey tape numbered sequentially with flag series WFD-1 to WFD-31. Wetland C consists of a central area of palustrine emergent (PEM) broad-leaf cattail marsh and open water bounded by red maple swamp (PFO) to the east and west. Wetland D consists of a western area of PEM *Phragmites* marsh and eastern area of a red maple swamp (PFO).

Common vegetation in the forested wetlands includes red maple, green ash, American elm, glossy buckthorn (*Frangula alnus*), white pine, cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), and Canada mayflower (*Maianthemum canadense*). Common upland vegetation includes red oak, white oak (*Quercus alba*), white pine (*Pinus strobus*), Virginia creeper (*Parthenocissus quinquefolia*), Oriental bittersweet, Tatarian honeysuckle (*Lonicera tatarica*), poison ivy (*Toxicodendron radicans*), and goldenrods. Soils within the wetlands consist of silty loam with a shallow depleted matrix. Upland soils were fine sandy loam to loamy fine sand and indicative of historic fill and disturbance. Indicators of wetland hydrology included surface water, water stained leaves, and saturation at the soil surface. State and federal boundaries are coincident. The west end of the Wetland D (Phragmites marsh) adjacent to a parking lot was particularly filled with trash and debris, much of which appeared recent.

SECTION II – APPENDICES

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

Photograph 4: View of Wetland C near flag WFC-18, along the west side of Route 138, opposite Wetland D.

APPENDIX B

WETLAND DELINEATION FIELD DATA FORMS

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 38, Wilmington, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **May 21-22, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple (*Acer rubrum*)	85.5	100.0%	YES	**FAC***
Saplings				
White pine (*Pinus strobus*)	20.5	66.1%	YES	**FACU**
Red maple (*Acer rubrum*)	10.5	33.9%	YES	**FAC***
Shrubs				
Glossy buckthorn (*Frangula alnus*)	10.5	77.8%	YES	**FAC***
White pine (*Pinus strobus*)	3.0	22.2%	YES	**FACU**
Herbaceous				
Canada mayflower (*Maianthemum canadense*)	10.5	100.0%	YES	**FACU**
Cinnamon fern (*Osmunda cinnamomea*)	T	NA	NO	**FACW***
Vines				

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants: 3**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts – Rt. 38, Wilmington, MA. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS). Accessed online June 1, 2020.**

Map Number/Soil Type Mapped**:**

6A – Scarboro mucky fine sandy loam; 51A – Swansea muck; 52A – Freetown muck; 105E – Rock outcrop-Hollis complex; 253A – Hinckley loamy sand; 255A&B – Windsor loamy sand; 256 A&B – Deerfield loamy fine sand; 302D – Nmontauk fine sandy loam; 602 – Urban Land; 653 – Udorthents, sandy; 655 – Udorthents, wet substratum; 656 – Udorthents-Urban land complex.

Hydric Soil Inclusions: **YES**

Walpole; Wareham; Whitman

Are field observations consistent with soil survey? YES ☑ NO ☐

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
Oe (hemic)	**4-0”**	**7.5YR 2.5/1**	
A (silt loam)	**0-2”**	**10YR 3/1**	
B (silt loam)	**2-8”**	**10YR 5/1**	**10YR 3/4 (2%) 7.5YR _/1 (20%)**
A_2 (mucky loam)	**8-14”**	**10YR 2/1**	
B_2 (loamy fine sand)	**14-20”**	**7.5YR 3/1 & 3/3 mix**	

Remarks:

3. Other: **Historic disturbance/fill.**

Conclusion: Is soil hydric? YES ☑ NO ☐

Other Indicators of Hydrology:

☑ Site inundated: **Surface water present in plot area**

☑ Depth to free water in observation hole: **7 inches**

☑ Depth to soil saturation in observation hole: **At surface**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ Oxidized rhizospheres: _____

☑ Water-stained leaves: _____

☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other): _____

☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☑	☐
Other indicators of hydrology present	☑	☐
Sample location is in BVW	☑	☐

Applicant: **MassDOT** Prepared by: **Lucas Environmental, LLC** Project Location: **Route 38, Wilmington, MA**

☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only

☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II

☐ Method other than dominance test used (attach additional information)

SECTION I. VEGETATION

Date of Delineation: **May 21-22, 2020**

A. Sample Layer and Plant Species (by common/scientific name)	B. Percent Cover (or basal area)	C. Percent Dominance	D. Dominant Plant (yes or no)	E. Wetland Indicator Category*
Tree				
Red maple (*Acer rubrum*)	20.5	66.1%	YES	**FAC***
American elm (*Ulmus americana*)	10.5	33.9%	YES	**FACW***
Saplings				
Shrubs				
Glossy buckthorn (*Frangula alnus*)	38.0	64.4%	YES	**FAC***
White pine (*Pinus strobus*)	10.5	17.8%	NO	FACU
American elm (*Ulmus americana*)	10.5	17.8%	NO	FACW*
Herbaceous				
Canada mayflower (*Maianthemum canadense*)	10.5	100.0%	YES	**FACU**
Field horsetail (*Equisetum arvense*)	T	NA	NO	FAC*
Wrinkleleaf goldenrod (*Solidago rugosa*)	T	NA	NO	FAC*
Vines				
Oriental bittersweet (*Celastrus orbiculatus*)	3.0	100%	YES	**UPL**

* Use an asterisk to mark indicator plants: plant species listed in the wetlands Protection Act (MGL c.131, s.40); plants in the genus *Sphagnum*; plants listed as FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due to physiological or morphological adaptations, describe the adaptation next to the asterisk.

Vegetation conclusion:

Number of dominant wetland indicator plants: 3 **Number of dominant non-wetland indicator plants: 2**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants: YES ☑ NO ☐

SECTION II. INDICATORS OF HYDROLOGY

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? YES ☑ NO ☐

Title/Date: **Custom Soil Resource Report for Middlesex County, Massachusetts – Rt. 38, Wilmington, MA. (GIS Data from the Soil Survey Geographic - SSURGO data base produced by the USDA, NRCS). Accessed online June 1, 2020.**

Map Number/Soil Type Mapped**:**

6A – Scarboro mucky fine sandy loam; 51A – Swansea muck; 52A – Freetown muck; 105E – Rock outcrop-Hollis complex; 253A – Hinckley loamy sand; 255A&B – Windsor loamy sand; 256 A&B – Deerfield loamy fine sand; 302D – Nmontauk fine sandy loam; 602 – Urban Land; 653 – Udorthents, sandy; 655 – Udorthents, wet substratum; 656 – Udorthents-Urban land complex.

Hydric Soil Inclusions: **YES**

Walpole; Wareham; Whitman

Are field observations consistent with soil survey? YES ☑ NO ☐

Remarks:

2. Soil Description

Horizon	Depth	Matrix Color	Mottles Color
Oe (hemic)	**2-0”**	**10YR 2/2**	
A (fine sandy loam)	**0-4”**	**10YR 2/2**	
A/B (loamy fine sand)	**4-10”**	**10YR 3/2**	
B (fine sand)	**10-20”**	**10YR 5/3 and 3/3 mix**	**(see remark)**

Remarks: **Small redoximorphic features present below 18”**

3. Other: **Historic fill slope for roadway**.

Conclusion: Is soil hydric? YES ☐ NO ☑

Other Indicators of Hydrology:

☐ Site inundated: _____

☐ Depth to free water in observation hole: _____

☐ Depth to soil saturation in observation hole: **None to 20”**

☐ Water marks: _____

☐ Drift lines: _____

☐ Sediment deposits: _____

☐ Drainage patterns in BVW: _____

☐ Oxidized rhizospheres: _____

☐ Water-stained leaves: _____

☐ Recorded data (stream, lake, or tidal gauge; aerial photo; other):

_____

☐ Other: _____

Vegetation and Hydrology Conclusion

	YES	NO
Number of wetland indicator plants greater than or equal to number of non-wetland indicator plants	☑	☐
Hydric soils present	☐	☑
Other indicators of hydrology present	☐	☑
Sample location is in BVW	☐	☑

MassDEP Bordering Vegetated Wetland (310 CMR 10.55) Delineation Field Data Form

Applicant: Prepared by: **Ecosystem Solutions** Project Location: Butters Row, Wilmington DEP File #:

Check all that apply:

- ☐ Vegetation alone presumed adequate to delineate BVW boundary: fill out Section I only
- ☑ Vegetation and other indicators of hydrology used to delineate BVW boundary: fill out Sections I and II
- ☐ Method other than dominance test used (attach additional information)

Section I.

Observation Plot Number: **W** Transect #: **B18** Date: **7/18/2018**

	Common Name	Scientific Name	Percent Cover	Percent Dominance	Dominant Plant?	Wetland Indicator Plant?	Wetland Indicator Category
Ground	FERN,CINNAMON*	*Osmunda cinnamomea*	63	75	YES	YES	FACW
Ground	FERN,ROYAL*	*Osmunda regalis*	20.5	25	YES	YES	OBL
Shrub	BLUEBERRY,HIGHBUSH*	*Vaccinium corymbosum*	20.5	26	YES	YES	FACW-
Shrub	PINE,EASTERN WHITE	*Pinus strobus*	20.5	26	YES	NO	FACU
Shrub	BUCKTHORN,GLOSSY*	*Rhamnus frangula*	38	48	YES	YES	FAC
Tree	MAPLE,RED*	*Acer rubrum*	85.5	81	YES	YES	FAC
Tree	PINE,EASTERN WHITE	*Pinus strobus*	20.5	19	NO	NO	FACU

FAC, FAC+, FACW-, FACW, FACW+, or OBL; or plants with physiological or morphological adaptations. If any plants are identified as wetland indicator plants due t o physiological or morphological adaptations, describe the adaptation next to the asterisk

Vegetation conclusion:

Number of dominant wetland indicator plants: **5** Number of dominant non-wetland indicator plants: **1**

Is the number of dominant wetland plants equal to or greater than the number of dominant non-wetland plants? **YES**

If vegetation alone is presumed adequate to delineate the BVW boundary, submit this form with the Request for Determination of Applicability or Notice of Intent

Wetland @ B18

Section II. Indicators of Hydrology

Hydric Soil Interpretation

1. Soil Survey

Is there a published soil survey for this site? **yes**
Title/date: **Middlesex County (MA017), 2016**
Map number: **Accessed via GIS**
Soil type mapped: **655 - Udorthents, wet subtratum**
Hydric soil inclusions: **Freetown, Swansea**

Are field observations consistent with soil survey? Yes

Remarks:

2. Soil Description

Horizon	Depth	Color	Redox
Oe	**3-0**	**2.5YR2.5/3**	**-**
A	**0-8**	**10YR2/2**	**-**
Cg	**8-20**	**5Y6/1**	**-**

Remarks:

3. Other:

Conclusion: Is soil hydric? Yes

Other Indicators of Hydrology: (check all that apply & describe)

- ☐ Site Inundated:
- ☐ Depth to free water in observation hole:
- ☐ Depth to soil saturation in observation hole:
- ☐ Water marks:
- ☐ Drift lines:
- ☐ Sediment Deposits:
- ☐ Drainage patterns in BVW:
- ☐ Oxidized rhizospheres:
- ☐ Water-stained leaves:
- ☐ Recorded Data (streams, lake, or tidal gauge; aerial photo):
- ☐ Other:

Vegetation & Hydrology Conclusion

	YES	NO
Number of wetland indicator plants ≥ # of non-wetland indicator plants	☑	☐
Wetland hydrology present		
Hydric soil	☑	☐
Other indicators of hydrology	☐	☑
Sample location is in a BVW	**YES**	

Attachment E –Wetland Specifications

ITEM 755.35 INLAND WETLAND REPLICATION AREA LUMP SUM

REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)

The work under this item shall conform to the relevant provisions of Sections 120, 770, 771 of the Standard Specifications and the following:

Work under this item shall include furnishing material and the construction and maintenance of inland wetland replication areas as shown on the drawings and as required by the Engineer. Inland Wetland Replication Area shall hereafter be referred to as Replication Area. All work shall be in coordination with an approved Wetland Specialist as specified under that item.

Wetland Restoration work shall be as specified and compensated under that item. Construction of tidal wetlands shall be as specified under the appropriate item for tidal wetland mitigation.

The Replication Area shall be constructed prior to wetland impacts unless otherwise approved by the Engineer, specified herein, or specified in permit conditions and approvals. Construction schedule shall be appropriate to planting and seeding season (see below). Changes to this schedule will require written approval from the Engineer.

DESCRIPTION OF WORK

Construction of the Replication Area shall be completed as shown on the drawings at the following location(s):

Area/s A at Station: ***57+00*** Area = ***300*** sf.

Replication Area shall be constructed to meet the requirements of all associated permits and certifications, including relevant performance standards of the Massachusetts Wetlands Protection Act (MGL C. 131, s40), Section 401 Water Quality Certification, and Section 404, U.S. Army Corps of Engineers Permit.

The Contractor is responsible for protection and preservation of natural areas adjacent to the Replication Area both within and outside the project limits and for the duration of the Contract; including but not limited to damage to soils or vegetation due to erosion, sedimentation, compaction, trampling, vehicles, storage of materials, or other negligence shall be repaired to the satisfaction of the Engineer and at the Contractor's expense.

The Wetland Specialist overseeing the Wetland Replication construction work shall not be from the same company as that which is performing planting, seeding, or participating in any aspect of the Wetland Replication construction.

SUBMITTALS - DOCUMENTS

Request for Conditional Acceptance: As specified below, a letter requesting Conditional Acceptance of the work and the site conditions shall be submitted to the Engineer.

Request for Certificate of Compliance (Partial or Full): As specified below, shall be submitted to the Engineer for distribution to appropriate regulatory agencies.

Request for Final Acceptance: As specified below, a letter requesting Final Acceptance of the work and the site conditions shall be submitted to the Engineer.

Monitoring Reports: Reports shall be submitted to the Engineer as specified below. Reports shall be compensated under Item 755.75 and 755.76.

SUBMITTALS - MATERIAL

Soil and Amendments

No soil, compost, or other soil amendment imported to the work site shall contain seeds, roots, stems, or other viable parts of invasive plants or other noxious plants.

At least sixty (60) days prior to installation and prior to ordering, the Contractor shall submit for approval sources of soil, compost, and amendments. Submittal shall include the supplier and location of the source. Off-site sources shall be identified and available for inspection by the Wetland Specialist prior to transport of material to the site to verify that they are likely to be free of invasive plant species, including all viable plant parts.

Samples of tested and approved wetland soil and soil amendments for soil texture, organic carbon content or other routine soil analysis parameters (e.g., pH, Cation Exchange Capacity, Percent Base Saturation) and Soil Organic Matter Analysis will be required if requested by the Engineer. The grab samples shall be collected by the Contractor or Wetland Specialist from multiple representative locations in the wetland topsoil mix following the "Umass Soil and Plant Tissue Testing Laboratory Sampling and Collection Protocols" (or equivalent certification paperwork provided by the soil supplier). The lab analysis shall be provided to the Engineer along with written certification from the Contractor or Wetland Specialist that the wetland topsoil was collected per the referenced protocol and meets the desired specification. The analysis and written certification of same shall be provided to the Engineer prior to placing the wetland topsoil in the Replication Area.

Seed Mix

Certificate of Materials from the supplier shall be submitted 30 days prior to seeding and must be approved prior to ordering materials. Seed species listed on the certificate shall include ecotype region (i.e., *Asclepias incarnata*, PA Ecotype).

Seed tag from the bag of seed used shall be submitted to the Engineer at the time of seeding. Seed tag shall include ecotype region and species, guaranteed percentages of purity, weed content and germination of the seed, and the net weight. Seed tag shall match the Certificate of Materials, include the name of the supplier, and date material was sent.

Bill of lading or notarized Certificate of Compliance from the Supplier serving as proof of purchase shall be submitted if requested by the Engineer. Document shall include date of sale, quantity, lot number, and address of Supplier. This shall match the seed tag. Notary shall not work for either the contractor or seed supplier.

MATERIALS

Sediment Control Barrier and Erosion Prevention Measures
Sediment control barriers shall be per Item 767.121 and Coir Fiber Roll as per 767.13.

Erosion prevention measures for disturbed areas adjacent to the Replication Area shall include but not necessarily be limited to compost blankets, jute mesh, seeding, and/or combinations thereof as approved by the Engineer.

Sediment controls and erosion prevention devices and measures shall be compensated under the respective items.

Wetland Soil

Soil appropriate for the Replication Area may be either hydric soil excavated from the impacted wetland, a manufactured mix of compost and on-site borrow, or a combination thereof, as approved by the Engineer.

Hydric soil from the impacted wetland area may be spread on the surface of the constructed Replication Area as an inoculant or can be placed in a bulk fashion in a roughly 1:1 ratio of area and depth. Soil shall be handled such that the original soil structure is preserved and shall not be compacted, screened, or otherwise processed.

Hydric soil from the impacted wetland that is infested with invasive plant species identified on the Massachusetts Invasive Plant Advisory Group (MIPAG) shall not be used in the Replication Area unless approved by the Wetland Specialist and Engineer. To the extent possible, infested soil shall be disposed of within the project limits in an upland area outside of regulated areas and as approved by the Invasive Plant Management Strategy item (if in the contract) or by the Engineer.

A manufactured mix suitable for wetlands shall consist of on-site borrow from the proposed Replication Area (if approved by the Wetland Specialist and Engineer) thoroughly mixed with compost to achieve a target organic carbon content of 10-12% (up to 21% percent organic matter) by dry weight. The organic material used for mixing shall be well or partially decomposed. Clean leaf compost is the preferred soil amendment to achieve these standards though other materials may be used if approved by the Wetland Specialist and Engineer. Note that “clean” refers both to a negligible amount (<1%) of physical contaminants such as plastic and to the lack of chemical contaminants that might pose a hazard to plants or animals. Off-site borrow may be used for mixing if approved in advance by the Engineer.

No soil or soil amendment shall be brought on site without approval of the material source by the Wetland Specialist and the Engineer. Soils used in the replacement area shall be free of rocks greater than 4 inches in diameter.

Seed Mix

Seeding shall conform to the Standard Specifications Section M6, ROADSIDE DEVELOPMENT MATERIALS.

Mix 765.555 Wetland Mix – Part Shade Mix

	Botanical Name	Common Name	% PLS By Weight
Grass			
	Poa palustris	Fowl Bluegrass	25.00%
	Elymus riparius	Riverbank Wild Rye	19.00%
	Carex lurida	Shallow Sedge	17.00%
	Carex vulpinoidea	Fox Sedge	10.00%
	Cinna arundinacea	Sweet Woodreed	5.00%
	Sparganium eurycarpum	Giant Bur Reed Eco PA	4.00%
	Carex scoparia	Broom sedge	4.00%
	Carex lupulina	Hop Sedge	4.00%
	Scirpus polyphyllus	Many Leaved Bulrush	3.00%
	Juncus effusus	Soft Rush	2.50%
	Carex intumescens	Bladder Sedge	2.00%
	Sparganium americanum	Burrweed	2.00%
	Scirpus cyperinus	Woolgrass	1.00%
	Carex crinita	Fringed Sedge	1.00%
	Juncus tenuis	Path Rush	0.50%
			100.00%

Seeding Rate:
Species ecotype shall be as native to New England region as possible. Apply this mix at 20 lbs PLS/acre.

765.451 Part Shade Roadside Mix

	Botanical Name	Common Name	% PLS by Weight
Grass			
	Festuca rubra	Creeping Red Fescue	25.70%
	Elymus virginicus	Virginia Wild Rye	24.00%
	Schizachyrium scoparium	Little Blue Stem	22.50%
	Panicum virgatum	Switch Grass	10.00%
	Panicum clandestinum 'Tioga'	Deer Tongue 'Tioga'	7.00%
	Carex vulpinoidea	Fox Sedge	2.00%
	Agrostis perennans	Upland Bentgrass	2.00%
	Juncus effusus	Soft Rush	0.20%
			93.40%

Herb/Forb			
	Chamaecrista fasciculata	Partridge Pea	3.00%
	Penstemon digitalis	Beard-tongue	1.00%
	Zizia aurea	Golden Alexanders	0.30%
	Desmodium canadense	Showy Tick Trefoil	0.30%
	Solidago bicolor	White Goldenrod	0.20%
	Solidago caesia	Woodland Goldenrod	0.20%
	Rudbeckia hirta-VT ecotype	Black-eyed Susan-VT	0.20%
	Aster novae-angliae	New England Aster	0.20%
	Solidago odora	Licorice Scented	0.20%
	Aster divaricatus	White Wood Aster	0.20%
	Heliopsis helianthoides	Ox-Eye Sunflower	0.20%
	Pycnanthemum tenuifolium	Slender Mountain Mint	0.20%
	Monarda fistulosa	Wild Bergamot	0.10%
	Eupatorium perfoliatum	Boneset	0.10%
	Aster lateriflorus	Calico Aster	0.10%
	Oenothera fruticosa var. fruticosa	Sundrops	0.10%
			6.60%
			100.00%
	Seeding Rate: 15.0 lbs PLS/Acre		

Fertilizers shall not be used.

Water

The Contractor shall provide water and all equipment required at no extra cost. Water shall be suitable for irrigation and free from ingredients harmful to plants and wildlife. Water from the adjacent water bodies or waterways shall not be utilized. It is the Contractor's responsibility to correct injury or damage due to the lack of water, too much water, or use of contaminated water.

Mulch/Compost Blanket for Seeding

Hydromulch shall be per the manufacturer’s recommendations and shall be wood fiber or straw mulch only. Mulch shall be incidental to seeding.

Compost Blanket may be used in lieu of mulch for seeding. Compost Blanket shall meet the material and submittal requirements of that Item and shall be applied as specified below. Compost Blanket shall be compensated under that item.

CONSTRUCTION METHODS & SEQUENCE

SITE PROTECTION MEASURES

Minimizing Damage

The Contractor shall plan and execute operations in a manner minimizing the amount of excavated and exposed fill or other foreign materials that could be washed or otherwise carried into Replication Area and nearby resource areas.

Construction of and access to the Replication Area shall minimize damage to existing vegetation and soils as specified herein. Damage to soils or vegetation shall be repaired to the satisfaction of the Engineer and at the Contractor's expense. If required for soil remediation, tilling and the addition of compost shall be at the Contractor's expense.

Wetland topsoil shall be deposited and graded in the Replication Area in a manner that minimizes travel and subsequent compaction of the subgrade (including any specified pit and mound topography) to the extent practicable, including use of track mounted excavators as appropriate. Should soils be compacted, they shall be loosened by a method such as disking, spring-tooth harrowing and/or rototilling. The Contractor shall use boards, timber or composite mats, or other approved materials as necessary, to protect existing and/or new wetlands from compaction due to heavy foot traffic or if equipment is required to travel over wetland soil. All labor and materials required for protection and preservation of site shall be incidental to this item

Stockpiling of Soil

Stockpiling of soil, including hydric soil for replication, shall be at least 100 feet from the edge of the bordering and isolated vegetated wetlands and inland banks, unless approved otherwise by the Engineer. Stockpiled soils shall be securely stabilized and contained. Any areas of exposed soil or stockpiles within and adjacent to the Replication Area that will remain inactive for more than 7 calendar days shall be sown with a mix of rapid germinating annual grasses (e.g., annual rye) covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. As necessary, the mulch shall be anchored with a tacking coat (non-tar) applied by a hydro seeder or other method recommended by the Wetland Specialist in consultation with the Engineer. In the event that there is excess borrow, it shall be disposed of under Excavation, Item 120.1.

Sediment Barriers

Placement: Sediment barriers shall be installed along the downslope perimeter of the Replication Area beginning and ending in the surrounding upland so that no excavated material or disturbed soil can enter adjacent wetlands or waters. Where construction work is immediately upgradient of the wetland, barriers shall be located so as to protect the Replication Area until slopes are stabilized. Sediment barriers shall be in place and approved by the Engineer prior to excavation work. No work shall take place outside the barriers.

Maintenance: The Contractor shall ensure that all sediment barriers function as intended and at all times per the specifications of those respective items.

Existing Trees to Remain

Tree protection shall be per the relevant specifications and as shown on the plans or as required by the Engineer. To protect root systems of existing trees to remain, the limits of the Replication Area may be adjusted, but, the total area of replication required by the permits shall not be reduced. Access route may be adjusted as required.

Trees to be retained as snags (upright dead or dying trees left for wildlife habitat) within or adjacent to the Replication Area shall be as shown on the plans or as directed by the Wetland Specialist or Landscape Architect during the initial site walk. Trees to remain as snags shall be clearly marked prior to clearing. Trees that pose a potential fall hazard (i.e., are near a roadway) should have limbs and trunk cut such that the tree does not pose a fall hazard.

Coarse woody debris in the form of cut trees, stumps, logs, and brush shall be incorporated as shown on the plans or as directed by the Wetland Specialist or Landscape Architect. On site material shall be selected and marked by the Wetland Specialist, retained on the project site, and placed as specified below under Placement of Coarse Woody Debris.

All trees, stumps, or brush not specified to remain shall be removed and shall not be stockpiled in the wetland resource areas while awaiting disposal.

Work shall be coordinated with Clearing or Tree Removal Item and compensated under that Item.

PRE-WETLAND CONSTRUCTION SITE WALK

Delineating the Replication Area and Access Route. The Contractor shall stake out the Replication Area boundaries and the intended access route and set grade stakes for approval by the Wetland Specialist and Engineer. Following staking and demarcation of areas, the Engineer and Wetland Specialist shall approve or modify as necessary the limits of work, the access route, final location and configuration of replication, grade stake elevations, proposed location of sediment barriers, and review proposed construction methods.

As part of the delineation and approval process, the Wetland Specialist shall mark trees to be converted to snags, select course woody debris to be retained for re-use, and select rocks or other elements to be used for habitat features.

Invasive Plants: As part of the initial site walk, the wetland to be impacted and the proposed replication site shall be inspected for the presence of invasive plants. If invasive plants are found they shall be addressed as described herein under Invasive Plants.

SOIL WORK

Final grades in the Replication Area shall meet the target elevations as shown on the Plans or as adjusted by the Wetland Specialist to achieve the desired hydrology and micro-habitat. If adjustments are required, a Request for Information (RFI) shall be submitted to the Engineer for approval. Adjustments shall be documented and included in the As-Built plans (if required) and/or other applicable required documents.

<u>Excavation & Grading</u>

When required by permits, the Wetland Specialist shall notify MADEP and the ACOE (as applicable) at least 72 hours prior to excavation.

Soil in the proposed wetland areas that must be removed for grades to conform to the proposed elevations shall be stripped and disposed of, or, if suitable for reuse, be stockpiled in an approved location. Stockpiled soils shall be kept wet and not allowed to dry out. Procedures for maintaining appropriate moisture levels shall be documented by the Wetland Specialist and provided to the Engineer and the Contractor.

Replication area shall be excavated as shown on the drawings. Where replication area is adjacent to existing reference wetland, finish grade of replication shall generally match existing grades and micro-topography, notwithstanding any deviations that are necessary to achieve the desired hydrology and habitat in the Replication Area.

Prior to placement of backfill, scarify subgrade to a depth of 4 to 6 inches.

Placement of Wetland Soil

Following excavation, scarification, and grading of sub-grade, and after the sub-grade elevations are approved by the Wetland Specialist, suitable soil previously removed or an evenly mixed organic/mineral soil created on-site shall be spread to the design depth and thickness over the proposed wetland areas as shown on the plans and as directed by the Wetland Specialist.

Vehicles used to transport soil from offsite shall be washed or cleaned with air pressure to prevent exotic or invasive seeds or root fragments from contaminating the Replication Area.

Final Grading

The finished grade of the Replication Area shall be at an elevation that will provide an unrestricted hydrologic connection between the Replication Area and adjacent resource areas. The hydrologic connection should be in keeping with restoring the intended function of the replacement wetland relative to the impacted reference wetland. The Contractor shall verify that this elevation is not at a level that could negatively alter the hydrology of an adjacent wetland. Final elevations and grading of wetland soil shall be approved by the Wetland Specialist and the Engineer.

To avoid compaction once soil has been placed, no heavy equipment shall travel across placed soil and no work shall occur in wet or moist soil. Soil that is compacted due to construction activities shall be replaced with soil as specified herein and at the Contractor's expense.

RESTORING VEGETATION

Placement of Coarse Woody Material

If specified within this Contract or if directed by the Wetland Specialist or Landscape Architect during the initial site walk, woody debris shall be placed in the Replication Area and/or adjacent upland buffer. Material shall be placed as shown on the plans or as directed following placement of wetland soil and prior to application of compost and/or seed. Woody material shall cover a minimum of 5-20 percent of the Replication Area, depending on whether it is a meadow or woodland wetland and how much wood is available from construction clearing. Where trees are cut for construction purposes, logs of a minimum length of 8 feet must comprise a minimum of 50% of the woody material left on site. Brush shall be included along with logs and stumps as directed. Woody material shall be placed in a deliberate and naturalistic manner.

Seeding

Following placement of wetland soil and planting (if included), the Replication Area shall be seeded using one of the following methods:

- Broadcast by hand or with a hand-held spreader followed by application of straw mulch. If necessary, seed shall be lightly raked to insure good seed-to-soil contact.
- Hydro-seeded with hydro mulch per the Standard Specifications and per the manufacturer's directions.
- Hand broadcast seed with Compost Blanket pneumatically applied at the same time to ensure light cover of soil topdressing over seed.

If spring conditions are drier than usual, supplemental watering may be required. If sowing during the summer months, supplemental watering will likely be required until germination.

If required, seeding limits for different seed mixes shall be determined by the Wetland Specialist.

PLANT ESTABLISHMENT AND INVASIVE MANAGEMENT

Seeding that fails to established according to the conditions of acceptance below shall be over-seeded as required by the Engineer. Washouts and channels shall be repaired and stabilized prior to overseeding. Excessive weed growth shall be pulled out by the roots or, with approval from the Engineer, cut prior to over-seeding. Soil repair and weed control are incidental to this item.

Invasive Plants: Corrective measures shall be taken to remove or treat invasive plant species in the Replication Areas. Invasive plants shall include those listed as invasive by Massachusetts Invasive Plant Advisory Group (MIPAG) and the US Army Corp of Engineer's New England District's Compensatory Mitigation Guidance

The strategy for chemical and/or manual removal shall be as directed by the Wetland Specialist, shall continue for the duration of the monitoring period, and shall be incidental to this item.

CONDITIONAL ACCEPTANCE OF WORK

Conditional Acceptance shall indicate approval of the wetland construction work and agreement that work has been done according to plan or modified as approved.

Upon completion of construction, the Contractor shall submit a Request for Conditional Acceptance that includes a brief narrative from the Wetland Specialist demonstrating that the wetland replication construction work was done according to plans (or how modified) and meets required permit conditions. The narrative shall include, photo-documentation of pre-construction conditions as well as soil work, planting, and seeding. Seed tags shall be submitted as part of the Request for Conditional Acceptance.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist, and regulatory representative (if required) shall assess the Replication Area and surrounding areas. At a minimum, the following conditions shall be included in the narrative and reviewed as part of the on-site assessment of whether:

- The final finished target elevations have been met and maintained relative to the approved plans and reference wetland. Areas that are too high or too low should be identified along with suggested corrective measures.
- Hydrology meets performance standards.
- Specified seed mix has been seeded. If inspected 30 or more days after seeding, seeded species in the wetland and adjacent upland shall show signs of good germination and healthy growth.
- Planted woody and herbaceous species meet specifications and are establishing well.
- Soils are stabilized and there is no sediment in the wetland and no channeling of slopes.
- There are no invasive plants visible in the replication area.

Upon approval that the work meets the above conditions, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Replication work is not approved, MassDOT will issue a rejection letter requiring corrective actions. The Wetland Specialist shall recommend corrective actions. Work not approved shall be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

Erosion of adjacent slopes or the flow of sediments into the wetland between Conditional and Final Acceptance shall be immediately addressed by the Contractor.

REQUEST FOR CERTIFICATE OF COMPLIANCE

If required, a request for a Certificate of Compliance (Partial or Full) pursuant to the Massachusetts Wetlands Protection Act regulations shall be prepared and submitted to MassDOT within 30 days following Conditional Acceptance.

The Request for Certificate of Compliance shall include the following:

- A brief narrative of the work on company letterhead signed by the Wetland Specialist. Narrative shall be prepared as a MS Word document and shall include substantive explanation that demonstrates compliance with EACH relevant permit condition. Narrative shall note variations from the originally permitted design.
- As-built Drawings signed by the Contractor's PE registered in the Commonwealth of Massachusetts. As-built drawings shall show hydrologic conditions, status of plantings and seeding, and shall include a narrative and minimum of 4 photographs documenting site conditions. Plans should note variations from the originally permitted design.

  When required, drawings shall meet the Army Corp of Engineer's New England District's Compensatory Replication Guidance, including: scale in the range of 1"=20' to 1" = 100', contours at 1' intervals, spot elevations for intermediate elevations, and polygons outlining each Replication Area, and, as applicable, plant community types. The As-built Drawings shall be provided to the Engineer electronically in Portable Document Format (PDF). If requested by the Engineer, the Drawings shall be provided in printed paper format (11" x 17" sheets, unless otherwise directed). Drawings must be scalable.

- Other documents as required.

FINAL ACCEPTANCE OF WORK

Following one full growing season, the Contractor shall submit a Request for Final Acceptance. Submittal shall include a brief narrative of conditions. Upon receiving the Request, the Engineer, Contractor, Wetland Specialist and regulatory representative (if required) shall assess the Replication Area. Final Acceptance will initiate the start of the Wetland Monitoring Period.

The following conditions shall be inspected and approved for acceptance and payment.

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover at least 95 percent of the Replication Area, excluding areas of open water areas or planned bare soil.
- No sediments have entered the wetland.

- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.
- Silt fence and non-biodegradable sediment barrier materials have been removed.

If the mitigation work does not meet the above condition and is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions. Work not approved will be addressed by the Contractor at no extra cost.

Wetland Specialist shall be compensated under Item 755.75.

MONITORING REPORTS FOR REGULATORY COMPLIANCE

Post wetland construction Monitoring Reports shall be completed and submitted by the Wetland Specialist as specified and compensated under Item 755.76 Wetland Monitoring Reports.

Generally, the following conditions shall be met upon each inspection:

- Hydrology is functioning as intended.
- The desired seeded species are establishing well and cover 95 percent of the area, excluding areas of open water areas or planned bare soil.
- No sediments have entered into wetland.
- Adjacent slopes are stabilized with desirable vegetation.
- All planted species (if included) are living and establishing well.
- There are no visible invasive plants.

If, at the end of the required monitoring period, the requirements have not been met and success of the wetland replication area has not been achieved as determined by the Monitoring Reports, the Contractor shall provide corrective measures. All costs associated with corrective measures and plant replacement shall be incidental to this item with no additional compensation.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

Item 755.35 will be paid for at the Contract unit price per Lump Sum, which price shall include all labor, materials, equipment, submittals, maintenance, all required soil, site preparation, grading, wetland seeding, planting, mulching, watering, monitoring wells, registered surveyor, as-built plans, Request for Certificate of Compliance, and all incidental costs necessary to complete the work as required.

Payment shall be as follows:

- 60% upon Conditional Acceptance.
- 20% after receipt and acceptance of Certificate of Compliance by the Engineer and once all permit construction requirements have been met and approved.
- 20% upon Final Acceptance.

Excavation will be paid under Item 120.1
Sediment Control Barrier will be paid under Item 767.121
Coir Fiber Roll will be paid under Item 767.13

Wetland Specialist will be paid under Item 755.75
Wetland Monitoring Reports for follow-up monitoring will be paid under Item 755.76

ITEM 755.75 **WETLAND SPECIALIST** **HOUR**

REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)

Work under this Item shall be for services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications hereafter referred to as the "Wetland Specialist."

"Wetland Mitigation" shall be used herein for applicable wetland work. For this project, applicable wetland work is for:

The Wetland Specialist shall demonstrate knowledge and expertise to coordinate and oversee all work associated with the Wetland Mitigation as defined herein, as shown on the Plans, as required by permits, and as specified under the relevant Wetland Mitigation items.

Regulatory monitoring reports following Final Acceptance of the Wetland Mitigation shall be per Item 755.76, Wetland Monitoring Reports.

For all onsite work, the Wetland Specialist shall sign in and sign out with the Engineer.

The Wetland Specialist shall not be from the same company as the company responsible for planting, seeding, and/or maintaining the wetland.

QUALIFICATIONS

The Wetland Specialist shall have a minimum of five (5) years of experience with construction and monitoring of wetland mitigation areas similar in size, type, and complexity to the Contract mitigation. When required by permits, at least ten (10) years of experience may be required. The Wetland Specialist shall be thoroughly versed in the Commonwealth of Massachusetts Wetlands Protection Act (MGL C.131, s.40), U.S. Army Corps of Engineers New England District Compensatory Mitigation Guidance, and all other relevant regulations of the Massachusetts Department of Environmental Protection and the U.S. Army Corps of Engineers New England District.

SUBMITTALS - QUALIFICATION

Within sixty (60) days following the Notice to Proceed, the Contractor shall provide proof of qualifications for the Wetland Specialist to the Engineer for approval. Submittals shall include, but not be limited to, the following:

- Resume of the individual on-site implementing the Wetland Specialist work. If the Wetland Specialist changes over the course of the project, the new individual shall submit resume and qualifications for approval 30 days prior to doing any work on-site.
- Resume of any personnel working on-site in place of the Wetland Specialist. Individual shall be approved prior to work on-site.
- Narrative describing the company, its expertise, technical qualifications and experience with wetland construction.

- At least three (3) references from prior work of a similar nature completed in the last five (5) years and by the individuals who will perform the work. Provide contact information for each reference including address, phone number and email.
- A summary of each reference project including nature of the work, project size, dates, and period of construction and monitoring, methodologies used, and summary of success (or not) in terms of meeting performance objectives. Summary shall include a minimum of one before and one after photo for each project.

SUBMITTALS – DOCUMENTATION AND REPORTS

Wetland Construction Oversight

Wetland Specialist shall provide documentation of pre-existing conditions and wetland construction as specified below and as part of fulfilling the Scope of Work described below. Documentation shall include photos that are clear and legible. Photos are incidental to this item.

- ***Site Walk Prior to Disturbance and Construction of Wetlands:*** Provide brief assessment with photos, including documentation of the existing wetlands to be impacted (both permanent and temporary), proposed wetland replication area, and reference/model wetland areas (typically an adjacent undisturbed wetland or the existing wetland to be impacted). Photos of existing wetlands that will be temporarily impacted shall include a view from at least 3 angles.
- ***Excavation and Grading:*** Documentation shall include minimum of two photos of the excavated wetland and two photos after final grading prior to planting and seeding. For restoration areas, photos shall show soil preparation (i.e, tilling and grading), if applicable.
- ***Approval of Subgrades****:* The Wetland Specialist shall inspect the sub-grade of the Replication Area to ensure that proper hydrology is likely to be established and shall provide the Engineer with written confirmation and photographs upon completion of subgrade excavation work. Written confirmation shall include recommended field adjustments, based on field observations, to achieve the desired hydrology and designed wetland system.
- ***Planting and Seeding:*** Provide assessment and photos of vegetation upon completion of planting and seeding work.
- ***Data logger output from Monitoring Wells*** shall be submitted with reports, if applicable and requested.

Wetland construction documentation and reports shall be submitted with Request for Conditional Acceptance and for the Order of Conditions, Water Quality Certifications, and other regulatory permits as required.

Requests for Acceptance of Work & Regulatory Compliance

The Wetland Specialist shall submit the following documents if and as specified herein and under Item the relevant Wetland Mitigation items:

- Request for Conditional Acceptance.
- Request for Certificate of Compliance (Partial or Full) when applicable.
- Request for Final Acceptance.

SCOPE OF WORK

In the event of discrepancies with the applicable permits, the Wetland Specialist shall submit a Request for Information (RFI) to the Engineer.

General

The Wetland Specialist shall be responsible for the following:

- Review and have a comprehensive knowledge of the environmental permits relevant to the specific mitigation work being done so as to ensure compliance throughout the duration of the contract.
- Identify and inform the Contractor and Engineer of unique site conditions which may require adjustments to the schedule, design, or construction methods. For example, wildlife nesting, illegal dumping, or rare species.
- Identify and inform the Contractor and Engineer of any sediment or erosion control problems observed within mitigation areas.
- Advise so as to avoid impacts to adjacent areas and regulated wetland resources.
- Participate in necessary meetings as required by permits and when requested by the Engineer.

Inspections & Construction Oversight

The Wetland Specialist shall be responsible for, but not limited to, the following:

- Pre-Construction Site Walk
    - Following surveying, flagging, and staking of all relevant boundaries and elevations by the Contractor, the Wetland Specialist shall walk the site with the Engineer and the Contractor to review existing and proposed conditions, recommend changes if necessary, and approve the following: location and boundaries of the Mitigation Area, target elevations and grades, location of tree protection associated with the Mitigation Area, and final layout and limits of clearing for access route.
    - Select and mark snags, logs, and woody material to be retained for placement in the Wetland Mitigation, as appropriate.
    - Note invasive plants in and adjacent to Wetland Mitigation.
    - Provide summary report if and as specified under Wetland Mitigation items.
- Excavation, Soil Placement, Grading for Replication Areas
    - Approve excavated depth and grading for appropriate wetland hydrology, subsoil preparation, and finished grade of placed wetland soil.
    - Adjust grades as required and approve microtopography. If grades need to be adjusted, submit an RFI to the Engineer.
    - If requested by the Engineer, the Wetland Specialist shall inspect stockpiled wetland soil for moisture content and signs of undesirable weeds.

- Soil Protection and Restoration Measures for Restoration Areas
    - Review and approve methods of soil protection and restoration if required.
    - Confirm decompaction will adequately restore appropriate wetland hydrology. If decompaction measures need to be adjusted, submit an RFI to the Engineer.
- Re-vegetation of Mitigation Area
    - Placement of woody material to be re-used.
    - Verify seed used complies with specifications and site conditions, determine limits for wetland seeding based on elevations, approve seeding and mulching methods, and collect seed tags to submit with Request for Conditional Acceptance.
    - Review planting methods (if applicable) prior to installation and oversee layout of wetland plants.

Conditional Acceptance

Upon completion of construction of the wetland, as part of the Request for Conditional Acceptance, the Wetland Specialist shall provide a brief narrative demonstrating that the wetland construction work was done according to plans (or how modified) and meets the conditions required for acceptance as specified under the Wetland Mitigation items. Submittal shall include a report and photo documention of pre-construction conditions, construction work, seeding, planting, and other work as specified under the Wetland Mitigation items. Photos of completed Wetland Restoration areas shall include the same views as the pre-construction reference photos.

Upon receipt of a Request for Conditional Acceptance, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the Wetland Mitigation items.

Upon approval, MassDOT will issue a letter of Conditional Acceptance. If the Wetland Mitigation work is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

Request for Certificate of Compliance

If required, a Request for Certificate of Compliance shall be prepared and submitted to the Engineer immediately following Conditional Acceptance. Request shall be as specified under the relevant Wetland Mitigation items.

Request for Final Acceptance

Following one full growing season, the Wetland Specialist shall provide a brief narrative of the status of the Wetland Mitigation to be submitted with the Request for Final Acceptance.

Upon receipt of the Request, the Engineer, the Wetland Specialist and regulatory representative (if required) shall assess the Wetland Mitigation and surrounding area to ensure that it meets the conditions specified under the relevant Wetland Mitigation items.

If the Wetland Mitigation is not approved, MassDOT will issue a rejection letter requiring corrective action. The Wetland Specialist shall recommend corrective actions.

METHOD OF MEASUREMENT

Item 755.75 Wetland Specialist shall be measured per hour for on-site service provided by the Wetland Specialist.

Work shall include all inspections, photos, submittals, and associated tasks for construction and restoration oversight, narratives for Conditional and Final Acceptance, Request for Certificate of Compliance (Partial or Full) if required, documentation required for permits, and all other work specified above. Payment shall not include travel time or time spent off-site on reports. Decimal Pay Limits will be 0.25 hours.

BASIS OF PAYMENT

Item 755.75 Wetland Specialist shall be paid at the Contractor bid price for each hour, or fraction thereof, spent on-site to perform the work as described above. Reports and photo documentation are required for payment.

Post wetland construction reports shall be per Item 755.76, Wetland Monitoring Reports.

ITEM 755.76 WETLAND MONITORING REPORTS LUMP SUM

REV. 2022.01.01 (REV. DATE TO BE REMOVED BY MASSDOT CONTRACTS)

Work under this item shall be for the submittal of Wetland Monitoring Reports following the completion of wetland construction and shall include all inspections, photos, and other work required to complete those reports as specified herein.

"Wetland Mitigation" shall be used herein for applicable wetland work, whether Wetland Replication (creation of a new wetland) and/or Wetland Restoration (restoration after temporary impacts).

The Contractor shall retain the services of a Wetland Scientist, Wetland Ecologist, Restoration Ecologist, or other professional with similar qualifications, hereafter referred to as the "Wetland Specialist," to complete the Wetland Monitoring reports. Wetland Specialist shall meet requirements specified under Item 755.75 Wetland Specialist.

All on-site Wetland Specialist services required to complete the construction and revegetation of the wetland replication, including preparation and submission of monitoring reports during construction, shall be per Item 755.75 Wetland Specialist.

SCOPE OF WORK

Post-Construction Wetland Monitoring Reports

Final Acceptance of the wetland construction work as specified under item 755.35..shall initiate the beginning of the Monitoring Period.

Inspections and reports shall be performed to ensure compliance with mitigation requirements defined under the relevant Wetland Mitigation items and with all applicable environmental permits. Monitoring reports shall cover the following:

- Identification of all plant species present
- Percent cover for each plant species and overall percent surface area cover by indigenous wetland plant species for replication area and upland
- Description of the viability, health, and vigor of installed plants as well as volunteer plant species within the replication areas
- Description of remedial measures taken to ensure criteria are met
- Depth to apparent water table and/or depth of surface inundation, both as measured from the soil surface and data loggers, as appropriate.
- A conclusion regarding the success of the wetland mitigation area relative to the performance standards at 310 CMR 10.55(4)(b) (unless varied), the design plans, and performance criteria established by MADEP in the variance conditions (when applicable), and the reference wetland.
- Recommendation for a corrective plan of action if needed.

Reports shall be submitted to the Engineer as a digital copy in Portable Document Format (PDF)